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**Two Women;
On the Cinematic Experience in Installation Art**

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Abstract

**Two Women;
On the Cinematic Experience in Installation Art**

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Two Women; On the Cinematic Experience in Installation Art documents the research and practice underpinning the installation art piece *Two Women*, a multimedia video and sound installation with kinetic machines. The research focuses on replicating the *cinematic experience* in the realm of installation art, by addressing the perceptual and physical experience of the moving image in space. With the use of new media technology, experiencing the moving image becomes progressive and interactive. The research covers aspects of the theoretical meaning of ‘the cinematic’, the history of embodiment and the senses, expanded cinema in the 1960s and 70s, contemporary cinematic art in the gallery as well as the theater, and the relationship between cinema and new media.

Two Women is practice-based research which utilizes a hybridization of film, installation art, electroacoustic composition, algorithmic narrative, and kinetic machines. The piece thematically addresses the invisible crisis of an old Korean woman in a framework of fictional

narrative, and a database of historical news archives. *Two Women* attempts to depict multiple layers of imagination, memory, and history in a physical space. In the piece, time is experienced as a fragmented, spatially distributed, and non-linear concept. *Two Women* investigates the research trajectories which constitute the technical, artistic, foundations and process for the artwork.

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Dedication

To my parents and James Hughes

Chapter 1. INTRODUCTION

This document describes the artistic research and practice of realizing cinematic experiences in the realm of installation art. It provides supporting material for the dissertation project, entitled *Two Women* as required for the Doctor of Philosophy degree in Digital Arts and Experimental Media at the University of Washington.

Two Women is a multi-media video and sound installation which utilizes a hybridization of film, installation art, electroacoustic composition, algorithmic narrative, and kinetic machines. The piece thematically addresses the invisible crisis of an old Korean woman in a framework of fictional narrative, and a database of historical news archives. *Two Women* attempts to depict multiple layers of imagination, memory, and history in a physical space. In the piece, time is experienced as a fragmented, spatially distributed, and non-linear concept.



Figure 1: *Two Women* Installation Documentation at *Currents: The Santa Fe International New Media Art Festival*, Santa Fe, NM, 2015

The creation of *Two Women* demanded a lot of complex problem solving, experimentation and an interdisciplinary team to bring each part of the project to a high level of

execution and refinement. The project is greatly indebted to this collaborative process. *Two Women* was realized by many artists including a writer, visual artists, actresses, film crews, a fabricator, and a software engineer. The entire production including prototypes, shooting video footage, audio recording, fabrication of hardware, software development and composition lasted about a little over two years.

Chapter 2: *Context For Research* explores the five main research topics supporting *Two Women*. *The Cinematic* raises the question of what *the cinematic* means. This section describes how to engage with cinematographic images, and how cinema functions as a way of thinking. *Embodiment, The Senses, and Spectatorship*, discusses the history of *embodied vision*, and the concept of *haptic visuality* which addresses the viewing experience as physical, tangible, and tactile. The section *Expanded Cinema* explores intermedia artwork of the 60s and 70s when artists such as Woody and Steina Vasulka, Bruce Nauman, Nam June Paik and Robert Whitman employed emerging technologies to convey cinematic experiences. *Cinematic Experiences Since 1990s* outlines the contemporary interaction and exchange between art and film, addressing issues of exhibiting moving images in art institutions, and the decay of cinema. *New Media and Cinema* compares and contrasts new media and cinema based on Lev Manovich's theory. Chapter 2 concludes with the presentation of several new media artworks based on real-time distant communication or the use of databases for the creation of new narratives.

Chapter 3: *Two Women* is dedicated to unpacking the project, from pre-production and prototype, to the final execution and exhibitions. Along with an overview of the project, some space is dedicated to writing about influences and inspirations for *Two Women*. *Suicide Related Data* presents and explains the artist's cultural and personal relationship to suicide - an essential instigation for the project. Important philosophical and psychological theories interconnected to the art-making practice are introduced. *Art and Film* exemplifies a few artworks which provided important references for the project. *Prototype / Preliminary*, discusses previous relevant research, brainstorming, and collaboration. The *Artistic Methodology* section describes the narrative, system design, fabrication, audio and video production, and composition in detail.

Chapter 4: *Future Direction / Conclusion* presents some technical improvements which will be implemented for future exhibitions of *Two Women* scheduled for 2017. Also, a new project, based on *Two Women*, is introduced. The chapter concludes with a discussion of future directions for research on the cinematic experience and video installation.

Chapter 2. CONTEXT FOR RESEARCH

The screen itself is the cerebral membrane where immediate and direct confrontations take place between the past and the future, the inside and the outside, at a distance impossible to determine, independent of any fixed point [...] The image no longer has space and primary characteristics but topology and time.¹

- Gilles Deleuze

2.1 The Cinematic

Since the mid 1990s, the discussion about artistic practice related to cinema is an increasingly recurrent theme in publishing, exhibitions, and curatorial projects. Major museums and galleries are mounting exhibitions to explore, and stage, the history of the dialogue between art and film. The boundary between art and film is less and less discernible and these exhibitions attempt to question what is meant by *cinematic*.

According to John Rajchman's essay entitled "Deleuze's Time, or How the Cinematic Changes Our Idea of Art", in 1934 Walter Benjamin foresaw the question of how the cinematic changes our idea of art.² It is not important to question whether cinema is art or not, Benjamin asserts. Instead, it's important to understand how the cinematic is already embedded into our "new mass industrial audio-visual means of film and projection"³ and transforms what we think of art.

For example, in the year of the Lumière brothers' first screening, Cubists were working on representing time and movement on the canvas by assembling a sequence of shifting angles, close-ups, cross-cutting and other cinematic devices.⁴ In the 1920s and 30s early experimental film, Dada/Surrealism, Futurism, and Constructivism incorporated time and motion with various filming and editing techniques. These movements developed complex and poetic plots to resist a conventional cinema. In a sense, these experimentations were inspirational to American avant-

¹ Gilles Deleuze, *Cinema 2: The time-image*, (The Athlone Press, 1989), 125.

² Walter Benjamin, "The Work of Art in the Age of Mechanical Reproduction", *Illuminations* (trans. Harry John), (New York: Schocken Books, 1969).

³ John Rajchman, "Deleuze's Time, or How the Cinematic Changes Our Idea of Art", *Art and the Moving Image: A critical Reader*, ed. Tanya Leighton (London: Tate Publishing and Afterall, 2008), 307.

⁴ A. L. Rees, *A History of Experimental Film and Video*, (BFI Publishing, 1999), 20.

garde filmmakers such as Maya Deren, and Stan Brakhage, who worked in the medium of conventional cinema, but wanted to thwart convention. In *Meshes of the Afternoon* (1943), Deren constructs a cyclical narrative format which was a pioneering breakaway from linear narrative formats, and also a criticism of the Hollywood film industry. Brakhage created expressive cinematic gestures, by physically painting and scratching directly on a celluloid to explore visual phenomena. His abandonment of lenses, shots, and linear storyline couldn't have been more of a departure from previous uses of the medium.

Gilles Deleuze seems to respond to Benjamin's provocation by illustrating how cinematographic images introduce a new way of relating our time and space, particularly "audio-visual thinking."⁵ The second volume of his book, *Cinema: The Time-Image* investigates this idea in detail in the context of Alain Resnais's short documentary film *Night and Fog* (1955). *Night and Fog* juxtaposes black and white archival footage of concentration camps with full color and slow tracking shots of the same camps in present-day (see fig.2.1). The film departs from prior documentaries by avoiding historical re-enactments and completely leaves out any description of the Holocaust victims' lives. Instead, *Night and Fog* plays with our sense of time and memory by juxtaposing the power of present and past images of the camp.



Figure 2.1: Alain Resnais, *Night and Fog* (1955), film stills

This film demonstrates Deleuze's innovative perspective: the *cinematographic image and sign* (i.e. the language of imagery) forces the viewer to question time. The cinematic technique isn't prescriptive, it doesn't tell you how to think, it just provides a space for contemplation.

⁵John Rajchman, "Deleuze's Time, or How the Cinematic Changes Our Idea of Art", *Art and the Moving Image: A critical Reader*, ed. Tanya Leighton (Tate Publishing and Afterall, 2008), 309.

Night and Fog adopted archival footage from concentration camps, but playing the images in the present gives new function and meaning to this footage. Contemporary sensibilities change our way of perceiving the past, which creates a new relation to our present. In the cinematic space, we no longer have a clear perspective of chronological time. We assemble interlocking puzzles of spatial and temporal memory in our psychology. Cinema posed philosophical questions of how we think of ourselves, orient/disorient our thinking, and relate to one to another.

The word *cinematic* in popular culture conjures up notions of a spectacle of the moving image and sound, but the idea should be divorced from these superficial features. The *cinematic* is a way of thinking, and being correlated to the world. Time and memory should be the center of research in art and film.

Two Women is an experiment in constructing an in-between place where physical and psychological time and space intersect. This in-between place evokes an individual's personal memory and helps to consciously create his or her own story through the artwork.

The remainder of this chapter will address the four main research areas that supported the creation of *Two Women*:

- Embodiment, the senses, and spectatorship
- Expanded cinema
- Cinematic experiences since the 1990s
- New media and Cinema

2.2 Embodiment, The Senses, and Spectatorship

The study of vision has a long history in Western visual art. The tradition extends continuously from the Renaissance study of linear perspective, to photography and cinema, all the way to contemporary computer vision research. The purpose of this study is a quest to portray the physical world objectively and acquire verisimilitude in representation. For the past few thousand years, the model of the camera obscura was noted and used as a reference for objective representation. Thinkers such as Euclid, Aristotle, Roger Bacon, and Leonardo da

Vinci meditated on how the camera obscura could provide guaranteed access to the objective truth about the external world.⁶

René Descartes proposed a very influential idea about vision, “the Third Meditation”⁷, which means rejecting human sensory perceptions in favor of a mechanical and mathematical representation of the world. His method was to shut down all the senses, including the eyes in order to truly observe the world. To Descartes, human eyes were uncertain to acquire the true objective perception. The camera aperture’s single vantage point gave the most accurate focal point to the world.

The film *The Draughtsman’s Contract* (1982) directed by Peter Greenaway played with the flawed concept of objective vision, and realistic representation, in the baroque period. The story begins with the protagonist Mr. Neville being hired to create twelve drawings of the patron’s estate. The protagonist wants to acquire a perfect and meticulous image by using a mathematical measurement. Throughout the film, he is frustrated and confused because his observed subjects are constantly changed, displaced, and chaotic. His thoughts and relationships evolve with the associated objects and people. Greenaway draws our attention to the impossibility of true objectivity.

Art historian Jonathan Crary argued the camera obscura model collapsed in the early nineteenth century because of the status of an observer’s body. Indeed, this model was replaced by radically different notions of an *observer* and what constitutes the senses. Crary cited Goethe’s *Theory of Colours*, and a new science of physiology, as evidence of this shift away from objectivity, toward new models of embodied vision, multisensory perception, and spectatorship.

Goethe’s *Theory of Colours* describes how the human body involuntarily produces optical experiences within the visual system, with phenomena such as the *afterimage*. Goethe’s interest in the afterimage reveals a great deal about the subjectivity of vision.⁸ The body has its own agency to produce and generate visual experiences.

⁶Jonathan Crary, “Modernizing Vision”, *Viewing Positions: Ways of Seeing Film*, ed. Linda Williams (Rutgers University Press, 1997), 24.

⁷Ibid., 26.

⁸Jonathan Crary, *Techniques of the Observer: On Vision and Modernity in the Nineteenth Century* (MIT Press, 1992), 67 - 72.

The development of the science of physiology was also a crucial factor of dispelling the idea of objective vision in the early nineteenth century. German Physiologist Johannes Müller's discovery of nerve energies observed that each of the five senses had a unique corresponding, and physiologically distinct, type of nerve. In Müller's experiment, electricity, pressure, and mechanical stimulation of the retina all produced luminous sensations.⁹ The experience of light had no connection to actual light, therefore vision could no longer be understood to be always representative of actual objects in the world.

The status of the observer triggered a significant paradigm shift in the discourse of vision and representation in Western philosophy and art. It is true that ideology behind the camera obscura led to the prolific inventions of photography and cinema, however our cognitive perceptions are not only acquired by sight, but also by embodied vision. In Crary's account, he calls this new integration of the subjective ground of vision a "corporeal" concept of vision. This acknowledgement of corporeality was one of the most pivotal shifts in the history of art, especially in the context of media artists. The cinematic experience is deeply entangled with the notion of corporeality.

The early cinema phenomenon "cinema of attractions,"¹⁰ a term coined by Tom Gunning, describes a fundamental way of understanding embodied spectatorship. Gunning writes, "the cinema of attractions solicits a highly conscious awareness of the film image engaging the viewer's curiosity."¹¹ Avant-garde films in the years 1906 and 1907 celebrated the moving image as an end in itself. The technological innovation was so novel, and so different from anything which came before, that the content was almost irrelevant. The moving image could stand on its own.

The observer also brings his or her own experiences to bear on any process of observation. Henri Bergson was interested in how the body mediates perception and memory. Based on Bergson's the notion of sense perception, film theorist Laura U. Marks noted,

⁹Ibid., 87- 94.

¹⁰Tom Gunning, "The Cinema of Attractions: Early Film, Its Spectator and the Avant-Garde", *Wide Angle*. Vol.8, nos. 3 & 4 Fall, 1986.

¹¹Tom Gunning, "An Aesthetic of Astonishment: Early Film and the (In) Credulous Spectator", *Viewing Positions: Ways of Seeing Film*, ed. Linda Williams (Rutgers University Press, 1997), 121.

Perception takes place not simply in a phenomenological present but in an engagement with individual and cultural memory. Attentive recognition, I suggested, is thus a participatory notion of spectatorship. We move between seeing the object, recalling the virtual images that it brings to mind, and comparing the virtual object thus created with the one before us.¹²

In her book *The Skin of the Film*, Marks promotes embodiment and the senses in cinema, especially the notions of *haptic visuality* and *tactile images*. Haptic visuality is a way of looking which lingers on the surface, provoking a feeling of an object which could almost be touched. Techniques of cinematography which induce haptic visuality include: extreme close-ups, camera movement, under/over exposure of images, and the use of aural textures.

The film *Hiroshima mon amour* (1959), directed by Alain Resnais and written by Marguerite Duras, depicts a stunning opening sequence which demonstrates haptic visuality and cinema of attractions. The shot features a low light setting, a close up of glowing dust or ashes showers down to cover two cropped bodies intertwined and locked in an embrace. At first, the sequence of images appears abstract, and the bodies are unrecognizable. Then, gradually, the viewer pieces together the textural images of the dusty bodies, which recall the remnants of death and the war.

Although the film doesn't explain or provide any narrative contextualization, the viewers sympathize and immediately comprehend the traumatic situation through the images. The fragments of traumatic memory are conveyed by the protagonist's dialogue, while the cropped body images, and a series of montages, interplay with the past and present scene of Japan after World War II.

Mona Hatoum's *Corps Étranger* (1994) is a media installation piece composed of a cylindrical space where the viewer is invited to enter and watch a video projection on the floor (see fig.2.2). The video shows an endoscopic image of Hatoum's internal body, which looks rather abject and disturbing. The sequence travels from the surface of the artist's body to visceral internal places like the esophagus, intestines, and cervix. The images are shot from a first-person perspective, therefore the viewer feels like traveling voyeuristically through the inside of the artist's body. The piece articulates an embodied visuality, as well as a visuality which makes us conscious of our bodies as objects.

¹²Laura U. Marks, *The Skin of the Film* (Duke University Press, 2000), 147.

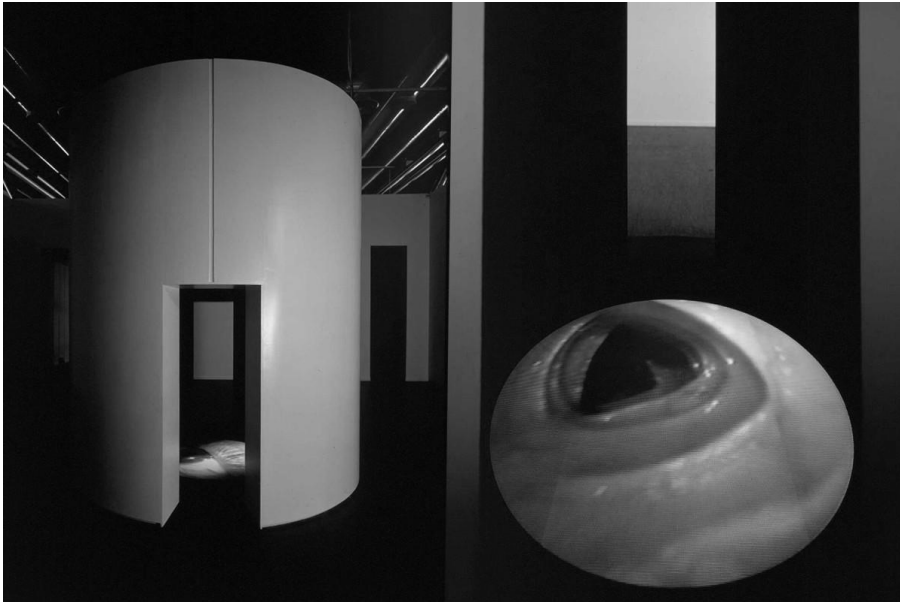


Figure 2.2: Mona Hatoum, *Corps Étranger* (1994), installation documentation

Patty Chang's performative video piece *Eels* (2001) begins with Chang sitting on the floor and positioned upright against a wall while she is staring at the camera. She's visibly irritated and uncomfortable, but the source of this discomfort isn't immediately evident (see fig.2.3). There are some clues, such as water stains on her blouse, but suddenly her torso comes alive with a coiling and uncoiling eel inside her shirt. It's pretty difficult not to project yourself into the scene and imagine how you'd feel in the same position. The movements of the eel, the squirming, moaning, and grimacing, all flow through the screen transcending the limits of sound and light, and generating haptic visuality.



Figure 2.3: Patty Chang, *Eels* (2001), video stills

2.3 Expanded Cinema

The origin of expanded cinema is elusive because the movement starts from various places and somehow existed at the birth of cinema. The term *expanded cinema* was coined by media theorist Gene Youngblood in 1970. Youngblood described different types of filmmaking which utilize interdisciplinary/experimental media, new technological inventions, reject the conventions of narrative cinema, or focus on non-traditional presentation (e.g. multi-screen, mixed-media, or site-specific).

The term *intermedia*¹³ is to describe the hybridization of visual art and film which began to appear in galleries in the 1960s. This hybridization included projected films, installed filmic sculptures, and cinematically situated performances and events. This new form of art created new artistic possibilities, and was deeply interconnected with the development and consumer availability of new media technology.

Woody and Steina Vasulka focused on emergent technology to explore the cinematic experience. In *Allvision* (1976) two cameras face each other looking at a mirroring sphere. The cameras slowly rotate about the mirror in the horizontal plane. Each camera sees half of the

¹³Tanya Leighton, "Introduction", *Art and The Moving Image: A Critical Reader* (Tate Publishing, 2008), 14.

room, so together the cameras take in the whole room, including the audience and the cameras themselves (see fig.2.4). The Vasulkas constructed a real-time video feedback system to produce an unfamiliar spatiotemporal experience in a video installation setup.



Figure 2.4: Steina Vasulka, *Allvision* (1976), video stills

Bruce Nauman's hybrid architectural installation *Live Taped Video Corridor* (1970), consists of two TV monitors above one another at the end of a very narrow corridor, which is about 10 meters long and 50cm wide. The lower monitor features recorded video of the corridor and the upper monitor shows live feeds from a camera, which is located about 3 meters above the entrance of the corridor. As a person walks down the corridor, approaching the monitors, they look increasingly smaller on the screen. Here, his architectural space becomes a theatrical set and a cinematographic model where the audience becomes the performer. This installation creates a feeling of alienation, disorienting biological/physical time, and spatial discomfort.

Nam June Paik's *Zen for Film* (1964) explores a hybridization between an art object and a theatrical event/performance. Paik was part of the Fluxus international artist group in the 70s, which fused multimedia technology with performance and events. Fluxus advocated the *process* of artmaking rather than a final art object, and was greatly influenced by the experimental composer John Cage. *Zen for Film* was inspired by John Cage's *4'33"* (1952), an open-score

composition. The first performance of 4'33" consisted of no music for the duration of four minutes and thirty three seconds. Instead, the listeners heard the sounds of their environment. Paik's piece adopted a similar strategy using light instead of sound. An unexposed 16mm celluloid strip runs through the film projector. The projected image is illuminated by a bright flickering light, but produces no image on the screen (see fig.2.5). The image of *Zen for Film* continually transforms and evolves over the duration of its installation because the celluloid accumulates dust and scratches, damaged by his own hand. The material of the film itself archives the progression of time. Andrew V. Uroskie writes,

We are trapped not in the progression of the narrative and the visual density of the photographic image, but in a temporality of the present - in a heightened experience of our phenomenological environment that though perhaps familiar within the museum or gallery space, remains utterly foreign with the cinematic theater.¹⁴

After adjusting our eyes in the darkness for a while, we become more consciously attentive, and start training our eyes to see small things. In contrast to a narrative film, the screen has changed minimally. As the viewer's eyes start wandering around, they notice the environment where the screen exists, and so on. The exhibition of the film is not an artwork itself; instead it is an event, or a kind of performance meant to encourage viewers to be aware of their surroundings and project their own interior images. The piece also seems to be a critique about the spectacle and visual production of conventional cinema.

¹⁴Andrew V. Uroskie, *Between The Black Box and The White Cube* (the University of Chicago Press, 2014), 28.

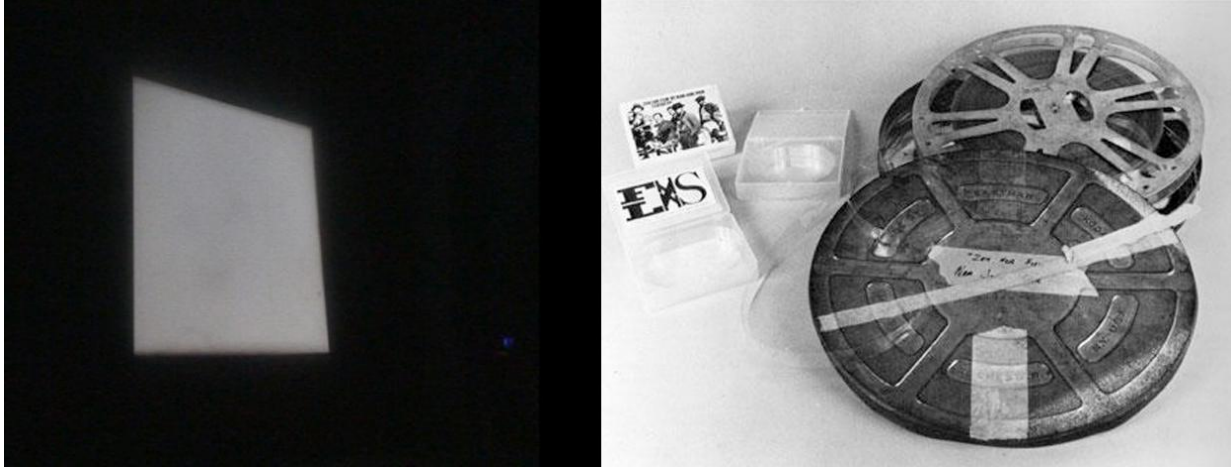


Figure 2.5: Nam June Paik, *Zen for Film* (1964), film projection documentation on the left and the original 16mm film with film cans, and a small version of for handheld loop viewer in the plastic cases.

During 1963 and 1964, Robert Whitman created a series of installations which he called “Cinema Pieces.”¹⁵ The installations consisted of 16mm projections of an intimate, mundane, human activity incorporated with everyday found objects, such as a shower, cabin, vanity table, or window. *Window* (1963) is the first piece of the series. In *Window*, a quaint-looking domestic window is mounted on the gallery wall as if it were an architectural feature (see fig.2.6). The window frame sets a boundary between inside and outside; thereby, it creates a pseudo-dimension of foreground and background. The wooden frame and glass are physically there, as well as some branches and foliage placed behind the glass to make the window scene more believable. Without the awareness of the viewer’s gaze, a woman disrobes and runs through bushes in a loop. The effect of superimposing a projected image over a real object demonstrates the theme of the piece which is about the interplay between reality and cinema, materiality and immateriality.

Whitman’s extended these hybrid media installation experiments to experiential theater. Whitman’s work *Prune. Flat.* (1965), blurred the lines between theater and cinema by projecting over actors on a stage, but the actors are dominated by the moving image. The actors didn’t act out a conventional narrative, they were merely props in the projected scenery.

¹⁵Ibid., 123



Figure 2.6: Robert Whitman, *Window* (1963), installation documentation. The image shows restored in its original form of *Window* at Broadway 1602 Gallery, New York in 2013

2.4 Cinematic Experiences Since 1990s

In the 1990s the relationship between art and film experienced a surge of crossover influence and engagement within venues like film festivals, galleries and museums. Jihoon Kim notes,

Rancière's observation attests to the fact that cinema and contemporary art commonly enter into a new mutual relationship by which one influences the other: Just as cinema's status as a unique art form continues to be confirmed by the artists and filmmakers' appropriation and investigation of it, so it is ready to be transformed by other artistic media- particularly video and digital.¹⁶

Early video art or art cinema movements from the 40s and 50s critiqued the consumer's spectatorship and conventional films. The mid 1990s marked a prominent shift away from these old artistic practices, and placed a new emphasis on the collective and social dimensions of the

¹⁶Jihoon Kim, "Between Auditorium and Gallery: Perception in Apichatpong Weerasethakul's Film and Installation," *Global Art Cinema: New Theories and Histories*, ed. Rosalind Galt and Karl Schoonover (Oxford University Press, 2010), 126.

reception of cinema. By discussing a number of recent media installations from artists and filmmakers, we should be able to see how the introduction of cinematic experiences influenced and changed spectatorial and curatorial relationships in the context of art institutions.

The period of the 90s was pregnant with crucial information for understanding cinematic experiences in the context of the art institution in first decade of the 21st century. This was the era of a new generation of artists' cinema, presenting *cinema* as a subject of art or an artistic medium to practice. In the 1996 essay *The Decay of Cinema*¹⁷, Susan Sontag expressed a melancholic view of the present and future cinema. She points out how the experience of cinema is not the same as in the 50s and 60s when cinema was the place where social interaction and intellectual discussion took place. Also the effect of computers and the development of image technologies interrupts capturing the essence of cinema's reality. Her essay attempts to bring cinema back into our consciousness.

There were several other significant occurrences related to artist's cinema: the rise of independent film productions, CGI movies, VHS/DVD media distributions as well as public and private theaters. Barbara Klinger articulates this fact in detail in her book, *Beyond the multiplex: cinema, new technologies, and the home* (2006). In her research Klinger surveys, there were many architecturally and technologically revolutionary film theaters built during the 1990s, and the number of newly built theaters nearly reached twenty-seven thousand. The multiplex theaters were designed particularly to respond to the growth of high-tech home theaters. The systems built aimed to be the most spectacular and immersive, and were designed to be ideal for Hollywood Blockbuster films. Thus, consumer and digital cultures blur the public and private viewing of movies, and also seem to somehow reveal the hidden borderline between art and film.

Artist's cinema claims its own genealogy and seeks to frame its moving images as an extension of another form of art practice. Artist's cinema falls into two different periods, at least from an art historical perspective, each with its own distinct character: the early American experimental cinema between the 40s and the 60s and the mid 90s to the present. In the earlier period, experimental filmmakers and artists such as Maya Deren, Michael Snow, and Kenneth Anger attempted to subvert film narrative, production practice, and Hollywood conventions. In

¹⁷Susan Sontag, "The Decay of Cinema," New York Times, 25 Feb. 1996.

their view, the medium of film raises consciousness through critical thinking, critiques the Hollywood film industry, and addresses the spectator as consumer.

Artists cinema and installations in the 90s seem to take a different approach. Rather than invoking popular culture criticism, artists use Hollywood films as a source of artistic materials, and their practice focused on the perceptual and phenomenological. As Chrissie Iles says, “Suddenly in the 1990s when cinema is in crisis you get artists falling in love with cinema, [...]”¹⁸ For example, in 1999, Douglas Gordon created a media installation based on Martin Scorsese’s film *Taxi Driver* (1976), Steve McQueen restaged Buster Keaton in his short film called *Deadpan* (1997), Pierre Huyghe appropriated Sidney Lumet’s *Dog Day Afternoon* (1975) in his piece called *The Third Memory* (1999), and Janet Cardiff, and George Bures Miller built a cinema inside of the gallery that you sit in called, *The Paradise Institute* (2000). Iles also infers that contemporary artist’s cinema, or expanded cinema, has become the locus of a radical questioning of the future of both aesthetic and social space. Then, do art institutions become an alternative space for cinema?

Our contemporary experience of space has itself become inextricably bound up with the technologies and institutions of mediation. Moving images never merely represent place, they must always also take place - they must be produced and exhibited within material spaces that are themselves structured through social, institutional, and discursive vectors.¹⁹

Major museum and gallery exhibitions seek to explore, and stage a new cinema. Film festivals probe the traditional boundaries of the cinematic medium. The keynote lecture for *The Shape of Things*, at the symposium of the 4th Auckland Triennial²⁰ in 2010 focuses on a curatorial project of moving images questioning how a gallery or museum space can achieve a cinematic experience with their respective viewers. In 2007, the International Short Film Festival

¹⁸Chrissie Iles, "Does the Museum Fail?: Podium Discussion at the 53rd International Short Film Festival Oberhausen," *Kinomuseum: Towards an Artists' Cinema* (Köln: Verlag der Buchhandlung Walther König, 2008), 128.

¹⁹Andrew V. Uroskie, *Between The Black Box and The White Cube* (the University of Chicago Press, 2014), 6.

²⁰Bettina Steinbrügge, "Modes of Curatorial Practices: Moving between art, Cinema, and performance," Keynote Lecture for 'The Shape of Things', the symposium of 4th Auckland Triennial, 22 May 2010 <www.aucklandtriennial.com/events/pdf/bettinasteinbrugge.pdf>

Oberhausen curated the exhibition *Kinomuseum*, and programmed a podium discussion entitled *Does the Museum Fail?*²¹ In the same year, there was a symposium entitled *From black box to white cube*²² at Jan van Eyck Academie, Post-Academic Institute in the Netherlands discussing filmmaker's installations in the context of exhibitions. The three papers entail historical and contemporary pragmatic concerns and issues about cinema in the museum space.

In *From black box to white cube*, the director of the Tate Gallery of Modern Art, Chris Dercon moderated a discussion with two panelists, the former Documenta X curator Catherine David, and Portuguese independent film director Pedro Costa, about processes and procedures of curating avant-garde filmmakers' installations in museum or gallery space during the post 1990s.

In 1995, David initiated and curated a multi-channel film installation based on Chantal Akerman's Documentary film *D'Est* (1993) at Jeu de Paume and the Walker Art Center. Also, she curated a number of exhibitions with filmmakers such as Jean-Luc Godard's *Histoire(s) du cinéma* (1997) and Pedro Costa's feature film *In Vanda's Room* (2000)²³.

When Dercon asks why an installation is for filmmakers, David gives an example of Akerman's installation and says, "It's an installation where you could see the hands of the filmmaker merge into the material and stop there. [...] It made the viewer very aware of the complexity of what was behind it and of the possible editing."²⁴ Two big changes apparently registered in the *D'Est* installation in comparison to the actual film: different sequences put together for multiple monitors play simultaneously, and Akerman's voiceover reading text about people walking and the concentration camps.

Within the frame of the work, this form of exhibiting cinema doesn't utilize the museum as an alternative cinema. Instead, this form of exhibition is more like an accessory, like a DVD's

²¹Pierre Bismuth, Mike Sperlinger, and Ian White. *Kinomuseum: Towards an Artists' Cinema* (Köln: Verlag der Buchhandlung Walther König, 2008), 115-153.

²²Pedro Costa, Catherine David, and Chris Dercon, "From black box to white cube," symposium at Jan Van Eyck Academie, De Witte Raaf, 26 May 2007 <http://archived.janvaneyck.nl/0_4_6_text_files/David_Dercon_Costa.html>

²³*In Vanda's Room* (2000) is a three hour fiction film shot in DV and realistic style. The filming took a year because it was one person crew production. It considers as a sequel to *Ossos* (1997), and interestingly was shot with 35mm films and much bigger production.

²⁴Catherine David, "From black box to white cube," symposium at Jan Van Eyck Academie, De Witte Raaf, 26 May 2007 <http://archived.janvaneyck.nl/0_4_6_text_files/David_Dercon_Costa.html>

bonus materials. As David replies, exhibiting and providing access to the sacred and unfolded space in film might only speak to a small group of people and cinephilia; however, it is worth doing it to show how complex filmic art is, and particularly for such avant-garde films that have long durations and limited distributional theaters.

Likewise, these types of cine-exhibitions or “kinomuseum” were often led by cinephile curators, critics, and programmers, and not based on filmmaker’s desires. Costa says, “It (exhibiting an independent film at a museum) does not depend on the filmmakers. We are pushed into the museums, the art galleries. Normally, decisions or choices are made by curators or critics who point out the aesthetic, pictorial qualities of the work of some filmmakers.”²⁵

Does the Museum Fail? addresses the curatorial issues of the viewing experience in art institutions. Ian White states his absolute dissatisfaction with artists’ cinema exhibitions in the gallery or museum space. He compares his viewing experiences of artist’s work at the Museum of Modern Art in New York to ‘e-flux video rental.’ Renting the artwork, for him, was a better viewing experience. White is also frustrated with the tendency of spectators to pass by and “sample” artists’ videos and films in the museum space. He says, “I think that the shopping mall mentality of the museum means that we don’t physically absorb anything fully, it just passes through us, though our eyes. And digital and video sort of confirm that - a different part of our brain reads electronic imagery to celluloid.”²⁶

Critiquing the cinematic viewing experience in an art institution also addresses other problems such as artists’ cinema distribution and its relationship to the market. Museums seem like a promising alternative cinema space, but without some innovation in exhibition configurations, the viewing experience will continue to be a critical issue. The current methods for handling artists’ cinema and independent films in art institutions fails on the level of individual experience, whereas the institution itself has a promising new market.

²⁵Ibid.

²⁶ Ian White, "Does the Museum Fail? Podium Discussion at the 53rd International Short Film Festival Oberhausen," *Kinomuseum: Towards an Artists' Cinema* (Köln: Verlag der Buchhandlung Walther König, 2008),142.

2.5 New Media and Cinema

New media art is popularly understood as computer-based artistic activities or the interplay between art and technology. At the end of 1990s, digital and network media rapidly became omnipresent in our society. Regardless of the artist's preferred media, digital computers have been used to produce art or used as a distribution platform. The use of the media technology and digital computers is deeply embedded within contemporary art practices. However, it is theoretically challenging to precisely define new media art - perhaps due to its short institutional history, emergent quality, or the interdisciplinary nature of the practice. Despite its ambiguous history, new media is inextricably linked to the history of old media technology such as print, photography and cinema. Indeed, new media shares many similar principles and ideas with cinema.

In *The Language of New Media* (2001), Lev Manovich explicitly analyzes new media by looking at it through film theory. Manovich carefully develops and focuses on the complex relationship between cinema and new media based on the avant garde film, *Man with a Movie Camera* (1929) by Dziga Vertov.

Cinema is what Manovich calls the "cultural interfaces" which record data of our lives and world - like the field of Human Computer Interface (HCI) is an interface to computer data. Vertov treated stacks of film footage as a database of Soviet Union life. Accessing those recordings in the present is a way to demonstrate Manovich's idea of cinema as cultural interfaces.

Editing is a key technique in the creation of spatio-temporal experiences. The cinematographic techniques invented by Vertov such as overlay, superimposition, split screen, fast/slow motion, dutch angle, jumpcut, freeze frame, etc. explore multiple spatio-temporal dimensions. Likewise, digital compositing creates a seamless virtual space. Since the film concept is the 'camera can be everywhere,' a superhuman vision deeply embedded in the contemporary world, Manovich writes, "kino-eye, can be used to decode the world."²⁷

Cinema is born from a repetition, similar to loops in computer programming. Programming involves the linear flow of data in loop with control structures. The loop is one of the most elementary structures of a procedure. Vertov experimented with a new way of constructing a

²⁷Lev Manovich, *The Language of New Media* (MIT, 2001), xxviii.

narrative. He didn't shoot the film in a succession, rather recorded footage objectively. In fact, his editor Elizaveta Svilova completed the film by turning the database of film into a non-linear narrative form. Manovich argues that new media designers and artists need to achieve this level of composition - "how to merge database and narrative into a new form."²⁸

Manovich's attempts to compare and contrast cinema and new media may simplify their complex relationships in some way, it is very challenging to build a theory of a new practice which is still in progression. Manovich approaches the current status of technology and culture through new media by cinematic forms. Fifteen years later from Manovich's writing, the twenty-first century development of new media technologies has shifted the balance of power away from cinema. We live in a transitional and transformational period. Hence, cinema is no longer dominant over all other art form.

Manovich argues cinema has "impressed itself most strongly on public memory."²⁹ He compares cinema with other media technologies such as photography and the phonograph as well as the later development of real-time transmissions like the telegraph, fax machine, and radio. Unlike real-time transmission, the new recording technologies of cinema led to the development of new arts. Manovich speculates that cinema as a new principle of arts is the reason why cinema retained such a strong impression on the public. "Despite persistent experiments of avant-garde artists which the modern technologies of real time communication - radio in the 1920s, video in the 1970s, the internet in the 1990s - the ability to communicate over a physical distance in real time did not seem by itself to inspire fundamentally new aesthetic principles the way film or tape recording did."³⁰

Stan Douglas's piece *Win, Place or Show* (1998) has a very interesting way of projecting a short story. In this piece, the two protagonists are shot with two cameras and ten different positions on the same set. The scene is repeated in a loop on two inclined screens set up next to each other with a small gap between them, but the actors positions in relation to the space and each other constantly shift upon repeated views. The shots are digitally controlled to show new combinations within the scene as acted, with each iteration having a duration of six minutes. The

²⁸Ibid., xxviii.

²⁹Ibid., 162.

³⁰Ibid., 162.

resulting playing time is about 20,000 hours, over two years, before any one combination of images was actually repeated.³¹ The pairings of two shots start out neutral and complimentary, but become distanced and alienated from each other as they are repeated.

Janet Cardiff and Georges Bures Miller's installation, *The Paradise Institute* (2001), invokes an uncanny cinematic viewing experience. Inside a white cube gallery, there is a two-level box of plywood construction with two doors - one an entrance, and the other an exit. The interior of the box is designed to create the illusion of a large theater, accomplished by means of small seats, a small screen, and faked perspective. Taking a seat in the upper rear balcony, which has about sixteen theater seats with headphones, a participant apparently faces a huge sea of velveteen seats and side-balconies converging upon a huge screen in the distance. After the participant sits and puts on headphones, the door is closed, and the system activates pre-recorded sound. The sounds the participant hears are the murmurs of conversations normally overheard before a movie begins in a theater. The audio recording was created using binaural technology, which gives a powerful illusion of a genuine audio-spatial experience, though isolated from the real world. Throughout the duration of the black and white movie, which lasts about 15 minutes, there is constant whispering and talking about the movie. A woman's voice shifts from the left to the right, conversationally referencing different parts of the film's narrative.

As the film narrative evolves, the distinction between on and off-screen completely breaks down. The voice starts in a nurturing manner, asking if the participant wants popcorn, etc, and then loud breathing and heavy sighs, followed by comments and digressions on the narrative. The attentive participant will eventually realize that the voice is talking about a different film. Blogs, other articles, and journals discuss the experience, the irritations, or the loss of interest in the voice, and express strong anger at not being able to focus on the film.³²

This theatrical apparatus manifests the multiple fractured spaces between a film and a spectator. By demonstrating the traditional and illusionistic form of the viewing experience with the binaural audio technology, *The Paradise Institute* fulfills an embodied experience, and attempts to bodily engage with nostalgic cinematic experience as well as the contemporary problem of the viewing experience.

³¹Rudolf Frieling, "Stan Douglas, *Win, Place or Show*," Media Art Net. Web. <<http://www.medienkunstnetz.de/works/win-place-or-show/>>

³²Andrew V. Uroskie, "Siting Cinema," *Art and the Moving Image*, ed. Tanya Leighton (Tate Publishing, 2008), 388.

Sanctum an interactive public art work by James Coupe and Juan Pampin commissioned by the Henry Art Gallery, and part of DXARTS research work. *Sanctum* uses surveillance systems to generate cinematic narratives along with social media content extracted from the demographic profiling of passers-by in real-time (see fig.2.7). The piece algorithmically seeks a way to find an intimate narrative potential in social media while surfacing the dissolution of privacy promoted by the embrace of social media.

In *Sanctum*, there are six surveillance cameras installed around the facade of the gallery, and 3 large video walls made up of 6 monitors each (2 columns of 3). As people enter an activation zone, within 12 feet of the facade of the building, they are tracked, analyzed, and recorded by video cameras which use computer vision algorithms to classify the subject based on age and gender. Using matching demographic data, stories are generated from extracts of volunteers' Facebook status updates. All monitors automatically play live and archived footage based on the same demographic profile. The system aims to create a complex and intense social network, and ultimately portrays us where we live now.



Figure 2.7: James Coupe and Juan Pampin, *Sanctum* (2013-2015), Public Art, Henry Art Gallery, Seattle Installation still (Photo Credit: RJ Sánchez | Solstream Studios)

Not only does *Sanctum* achieve a cinematic narrative, the piece visually achieves a cinematic montage by juxtaposing different perspective camera angles/shots. A split screen effect is realized by the grid of the physical monitor sets and the black gaps between the monitors. The composition of the video footage is dynamically laid out with individual videos spanning 1 to 6 monitors of a screen, and mixed with other videos to fill the entire screen. Especially when the subtitles of the Facebook-derived narrative are overlaid, the narrative makes sense with close-up live footage at the front. Another aspect of the long-running nature of *Sanctum* is the juxtaposition of footage from different times of the the day and weather conditions. This temporal variety coupled with the very particular ways in which people behave in front of the cameras leads to a rich and densely layered experience. The site specific nature of the piece, its outdoor viewing location, and the live video feeds create a cinematic experience wholly unlike a theater or gallery installation.

In 2014, the Netherlands collective design group CMD created a project called *Famous Deaths* (2014), which attempts to achieve a cinematic experience by scent alone. Their idea is to recreate the olfactory experience of the last few minutes of life preceding a famous person's death. The piece consists of 4 vignettes featuring J.F.Kennedy, Lady Diana, Moammar al-Qadhafi, and Whitney Houston. A participant is placed on a tray and slid into a modified mortuary refrigerator. The refrigerator has an obvious symbolic meaning, but functions very well as a sensory deprivation chamber, which is very dark and quiet (see fig.2.8). The audience starts hearing the actual sound of the event, and an accompanying series of scents are piped into the refrigerator.

For the J.F. Kennedy story, the President opens a car. The car slowly drives through the streets of Dallas as he happily waves to the crowd. Violent shots erupt, and the situation becomes chaos. While the audience is listening the story, they perceive the following smells at appropriate intervals: "... an autumn wind, the grass, the leather car seats, Jackie Kennedy's perfume exhaust fumes mingled with the somewhat musty scent of that limousine, and then... suddenly the penetrating scent of blood, brains and gunpowder drilling its way into your nostrils."³³

³³Marcel van Brakel, Wander Eikelboom, and Frederik Duerinck, "Famous Deaths," *Sense of Smell*, (The Eriskay Connection, 2014), 55.

The sound composition is composed specifically as a guide for olfactory experience. Without the framework of sound, the scents could be interpreted in wildly different ways - subjectively attached to the observer's accumulated mental baggage. By taking away all visual elements, the audience experiences the stories uniquely.

The researchers involved with CMD described several difficulties with working with scent, such as the inability to mix smells, or to sequence them too tightly. The quantity and quality of delivery is also very finicky. Creating a palette of smells is an active area of research, since the mechanisms aren't well understood. Practically, most artists/designers don't even have a vocabulary to talk about scent. In terms of the cinematic experience, it's difficult to say whether the installation successfully conveyed the story of the famous deaths, however the usage of scent is definitely an interesting and powerful modality to work with.



Figure 2.8: CMD concept, *Famous Deaths* (2014), IDFA International Documentary Filmfestival Amsterdam, The Netherlands, Photo by Nichon Glerum

Chapter 3. TWO WOMEN

I don't want it to look real. I don't want it to look natural but I want people to feel the time that it takes which is not the time that it really takes.³⁴

- Chantal Akerman

3.1 Project Description

Two Women portrays an individual's experience of psychological and physical trauma through a poetic narrative. The work recreates the invisible crisis of a 73 year old Korean woman. Although the motivation of her suicide is unknown, the story searches for possible reasons to understand her death. The unsettled mind is a crucial narrative force. The intimate interactions and interrelationships between the protagonist's body and symbolically loaded objects and contexts evokes themes of repression, resistance, submission, resignation, power, melancholy, death, and violence. The disembodied female voice leads us from place to place while it unfolds fragmented, fragile, and secret stories in the manner of magical realism.

The installation space is a cinematic realization of this fantasy, staged as a domestic room in a state of decline and despair. A pair of kinetic machines dominates the space. The machines record suicide-related news stories as morse code physically punched on a roll of black paper. Each roll of punched paper slowly feeds into a pool of water where it forms a perforated projection screen for videos of women submerged under the water. The paper is pulled up to the ceiling where soft light reveals the structure and pattern of the punched holes.

The narrative is interwoven with selected news stories culled from Korean newspapers dating as far back as the 1920's. The narrative and the stories are projected as subtitles on each of the punching machines - Korean on one machine, and English translations on the other. The piece is driven algorithmically, with the movement of the machines, audio, and video progressing in concert with one another and reinforcing each other.

³⁴Miriam Rosen, "In Her Own Time: An Interview with Chantal Akerman", trans. Jeanine Herman, *Artforum* (New York, April 2004).

Each iteration of the story lasts between eighteen and twenty four minutes including four fictional chapters and three news documents. A twenty second pause occurs between each iteration. During a typical eight hour continuous exhibition time, the news stories never repeat, and the machines continuously punch rows of holes in the form of morse code. For fifteen days, the length of perforated print was approximately 120 feet long.

Two Women was exhibited at *Currents: The Santa Fe International New Media Art Festival*, Santa Fe, NM on June 10, 2015. The piece was shown for three weeks. On November 21, 2015, the installation was restaged to be viewed at the Center for Digital Arts and Experimental Media (DXARTS) in Seattle, WA for two weeks.



Figure 3.1: *Two Women* Photo documentation, The installation front view at *Currents 2015 The Santa Fe International New Media Art Festival*, June 19 2015

There are two video modes for each machine; the news archive and the fictional narrative. The subtitles are projected on the paper before it enters the punching machine, where the video is projected into the water onto the submerged paper after it is punched. Figure 3.2 below shows an example of a news archive story with associated abstract particle imagery, whereas figure 3.3 depicts the subtitles of the narrative with recorded video.

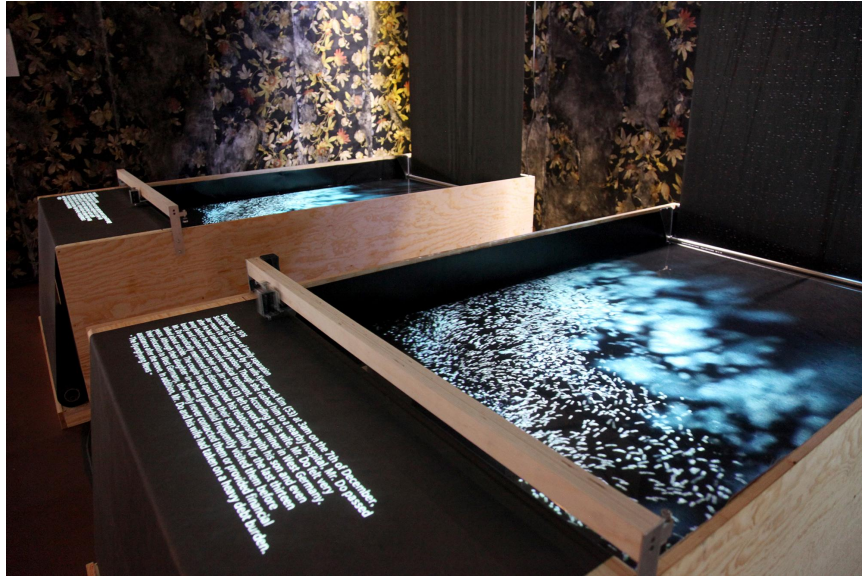


Figure 3.2: *Two Women* Photo documentation, displaying news archives, at *Currents 2015 The Santa Fe International New Media Art Festival*, June 19 2015



Figure 3.3: *Two Women* Photo documentation, the first chapter of the fictional story, at *Currents 2015 The Santa Fe International New Media Art Festival*, June 19 2015

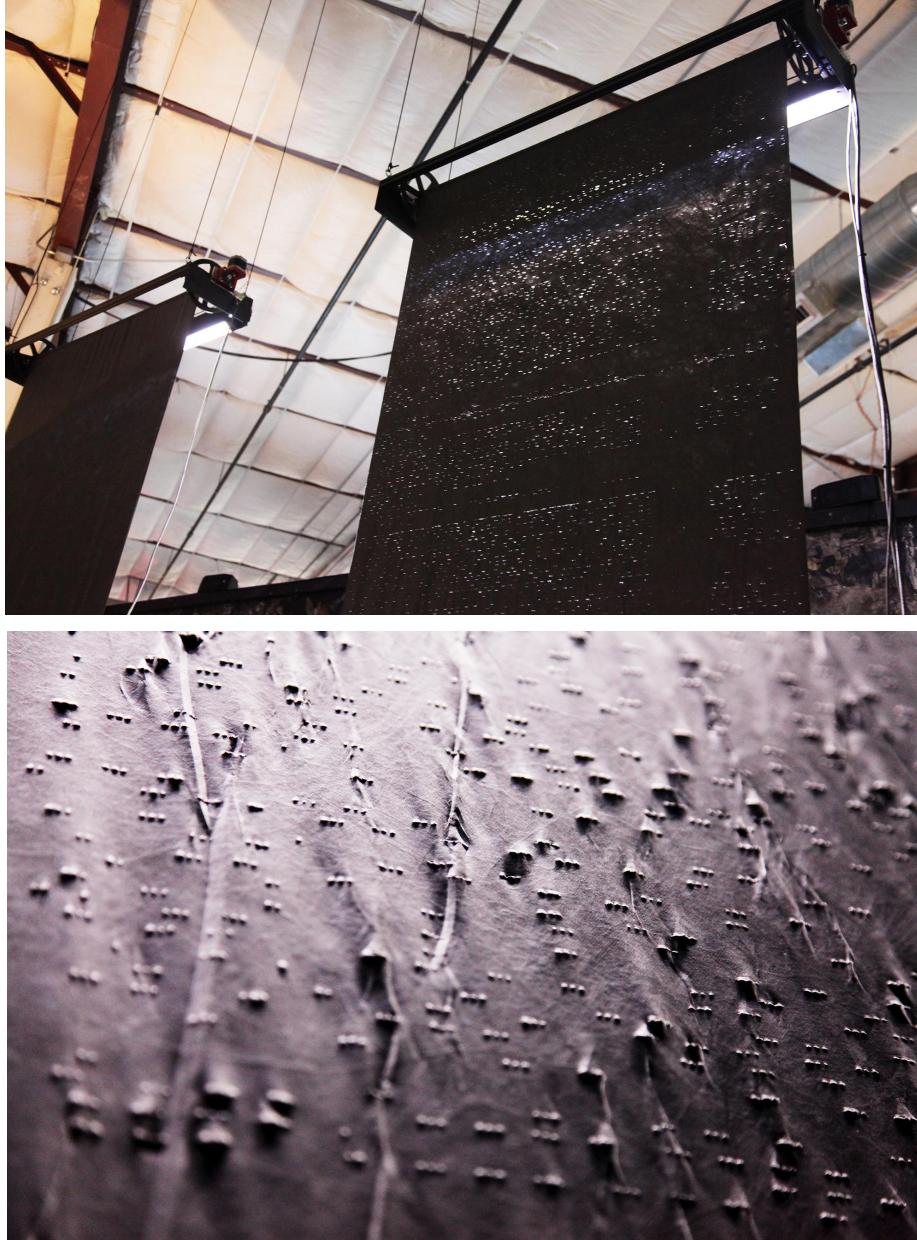


Figure 3.4: *Two Women* Photo documentation, front and reverse view of the perforated paper, at *Currents 2015 The Santa Fe International New Media Art Festival*, June 19 2015

In figure 3.4, the lower image shows a close-up of the punched paper as it's being drawn up by the spool to the ceiling. The upper image is a frontal shot of the paper and spooling mechanism.

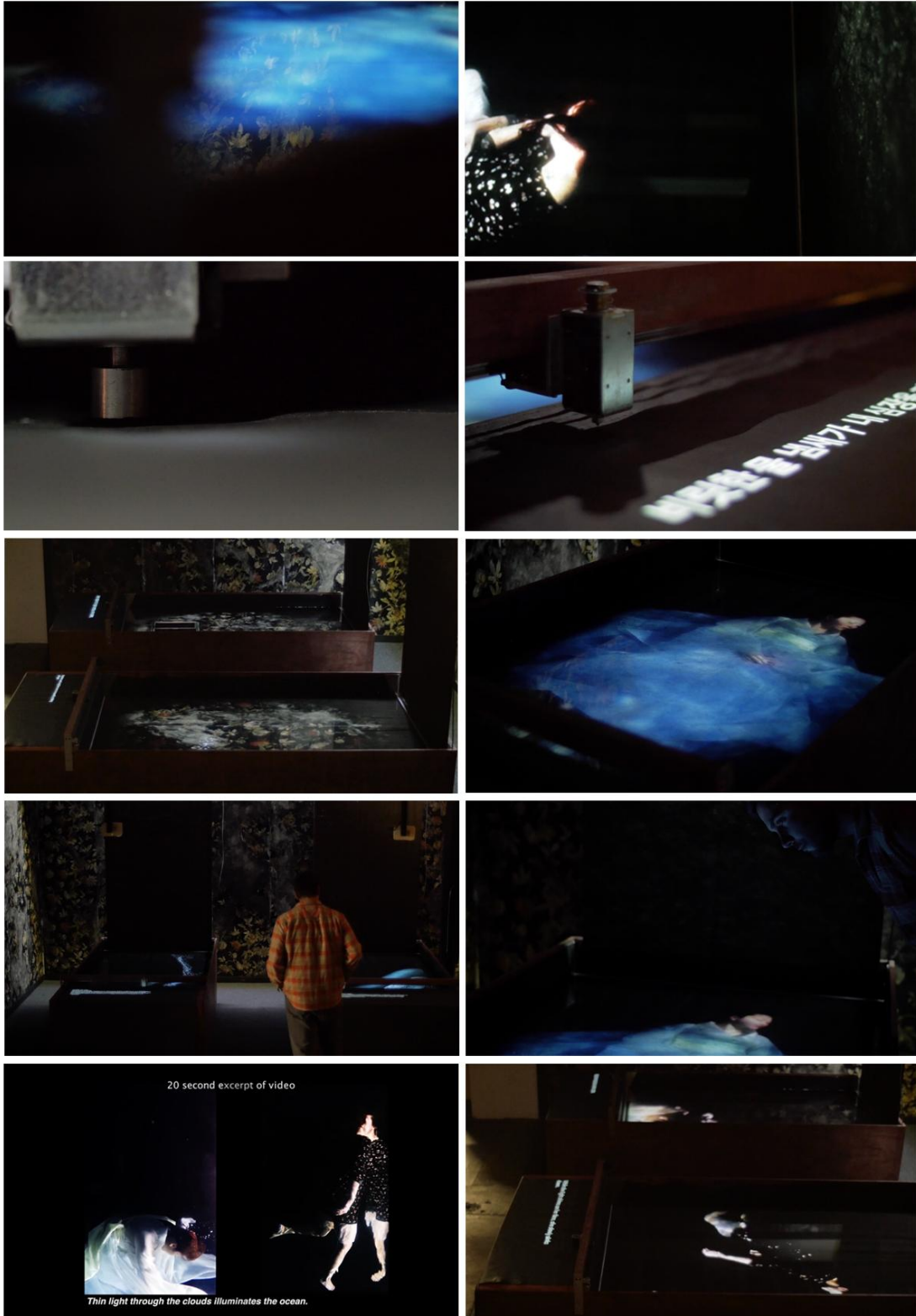


Figure 3.5: *Two Women* video documentation stills, at DXARTS Ballard Warehouse, Seattle, November 21 2015

3.2 Production Credits

Art & Direction:	Ha Na Lee, James Hughes
Scriptwriter:	Sang Hun Lee, Ha Na Lee
Sound Composition :	Ha Na Lee
Software Programing:	Ha Na Lee, James Hughes
Kinetic Sculpture Design & Fabrication:	James Hughes
Carpentry:	Jon Paden
Video Direction:	Ha Na Lee
Video Assistant Director:	Jin-kyung Kim
Voice Actress:	Kyung-mi Han
Voice Director:	Sang-hyun Park
Actress:	Hara Oh
Underwater Cinematography:	Do-yeol Kim
Rescue / Camera Assistant:	Dong-jun Lee
Director of Lighting:	Jin-yong Kim
Lighting Gaffer:	Hyun Kim
Costume Design:	Min-gyu Kim (Big Star Traditional Korean dress Shop)
Photo Documentation:	Ha Na Lee
Video Documentation:	Ha Na Lee, Adam Hogan
Documentation Actor:	Robert Twomey

Produced with generous support from:

- Center for Digital Arts and Experimental Media (DXARTS), University of Washington
- *Currents*: The Santa Fe International New Media Art Festival
- The Vilcek Foundation
- Artist Trust: Grants for Artist Project Funding 2014

3.3 Inspirations / Influences

Chapter 2: *Contexts for Research* provides in-depth coverage of scholarly interests of the relationship between art and cinema in conjunction with historical, theoretical and academic perspectives. This section describes the intimate personal inspirations and broad cross-section of influences which formed the thought process behind the creation of *Two Women*.

- **Suicide Related Data**

South Korea has the second highest rate of suicide in the world according to the World Health Organization, as well as the highest rate for a OECD member state. The suicide rate tripled over the past two decades, concurrent with South Korea's rise as an economic powerhouse. Suicide peaked in the years 2012-2014. The main reasons for this rise are attributed to the stagnant economy, competitive pressure, family, and the media. About 40 Koreans commit suicide everyday. Suicide was the nation's fourth-highest cause of death in 2012.³⁵

My grandmother was a victim of suicide in 2006. She was 73 years old. My family is still traumatized by the loss. Since it is taboo to talk about suicide in Korean culture, our family does not talk about it, and pursuing the story for the project caused a great deal of hesitation and hand-wringing. I began to wonder about the reasons for her death. I had these questions in my mind: how was her relationship with the rest of the family, especially me? What was the source of her sadness? Why did she urgently have to go without leaving any explanation, or a will? Those questions may be too late to address. I spoke with my brother, the scriptwriter of the project *Two Women*, about our grandmother. We don't have any answers, but we have many highly speculative interpretations.

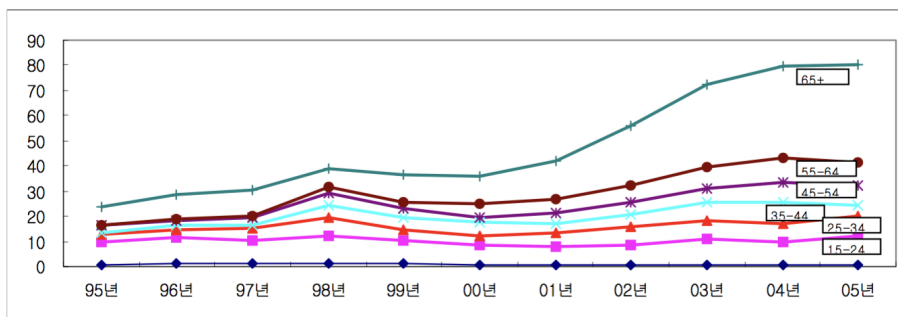
French sociologist Émile Durkheim classifies suicides into four groups: 1) *Egoistic Suicide*: an issue that insufficiently integrated with society; 2) *Altruistic Suicide*: an excessive individuation thus leads to suicide; 3) *Anomic suicide*: crisis of values and norms for example, a weak of social bond, a divorce, economic crisis, unemployment rate, a change of family value etc; 4) *Fatalistic suicide*: a state of being in restraint, such as a slave.³⁶

³⁵ Geoffrey Cain, "Why South Koreans Are Killing Themselves in Droves." GlobalPost, 15 Mar. 2014. Web. <http://www.salon.com/2014/03/15/why_is_suicide_so_popular_in_south_korea_partner/>.

³⁶ Hee-gil Lee, "Status Analysis and Causes of Elderly Suicide" Korean National Statistical Office, May. 2007. Web.

During the course of research about the cultural aspects of suicide in South Korea, it came to light that the suicide rate for elderly seniors is very high compared to other countries. As shown in the graph below, the rate of suicides for people over 65 years old grew dramatically and disproportionately between the years 1995 and 2005 (see fig.3.6). The high rate of suicide among the elderly may be due to nearly half of the country’s elderly population living below the poverty line. Due to a lack of a sufficient federally funded social safety net, many elderly commit suicide so as not to financially burden their families. Historically, Korean children took care of their parents, but this social structure has largely disappeared in the past twenty years leaving many parents with little or no retirement income or savings. Coupled with infirmity, low self-esteem, low self-efficacy, loneliness, family trouble, spousal illness, and the hardships of life, elderly suicide would largely be classified as *Anomic suicide*.

<그림 2> 연령별 자살률 추이('95년-'05년)



자료 : 해당년도 사망원인통계

Figure 3.6: “Status Analysis and Causes of Elderly Suicide”, reported by Korean National Statistical Office, May 2007

In 2012, Korean Institute for Health and Social Affairs presented research on utilizing Google’s “big data” to analyze suicide factors. The main conclusion of the research was the rates of suicides were directly proportional to the quantity of suicide-related searches in Google. Utilizing this data the system proactively helps people by displaying text messages about stress relief programs in pop-up windows. The report promotes the need to share data and provide easy access to information.

<http://kostat.go.kr/edu/sri_kor_new/1/1/index.action?bmode=read&p_idx=61&pageNo=7&search_mode=&keyword=>.

- **Julia Kristeva**

The books *Black Sun: Depression and Melancholia* (1989) and *Power of Horror* (1982) by Julia Kristeva were very influential to this project. Kristeva's work is heavily based in the psychoanalytic underpinnings of linguistics. The imaginary/semiotic realm is seen as a pre-condition for symbolic, linguistic articulation. A potentially more interesting area of her work spotlights *unsymbolized* areas in our psychology, where the imaginary/semiotic realm threatens to disrupt the orderliness of the symbolic realm.

In psychoanalytic theory, depression or melancholia could be defined as a mourning over something 'the loss of the Thing.' Depression and melancholy are marked by a lack of linguistic activity - gaps, silences, inability to form complete verbal sequences in dialogue - which points to a corpus of semiotics which remain unsymbolized. Kristeva's psychoanalytic theory posits that art is central to bringing these unsymbolized concepts into the real world. Only by making art can these symbolic and social capacities arise and be sustained. The artwork becomes a psychic representative of this unmapped, immemorial, immaterial idea.

Freud and other psychoanalytic theorists argue that a depressed person mourns over an "internal object." In the classical account, melancholia occurs when the subject feels both a love and hate relationship towards the internal object. The subject cannot live without the object, but hates it because of her ability to lose it. The subject may consider suicide, to kill the hated object, out of her own hostility. This kind of depression is what Kristeva defined as *objectal depression*. Kristeva claims the depressed person feels very much wounded, and is wrapped up in their own sadness. The subject has a loss of interest and inability to speak; therefore the subject cannot name what she has lost. The lost thing is unnamable and incommunicable. Kristeva uses the word melancholia to refer to this type of depression, and calls it *narcissistic depression*.

Kristeva's melancholia (*narcissistic depression*) is particularly interesting to me because it is a condition which cannot discern between subject and object. Since the depressed person cannot symbolize what he or she lost, the lost thing is enigmatic and imaginary. The sublimated process of transferring something from the imaginary to the symbolic is at the heart of art making. Kristeva gives examples of artists such as poet Gérard de Nerval, novelist Fyodor Dostoyevsky, and novelist and playwright Marguerite Duras who attempted to find a way to name unnamed things, which Kristeva sees as the sublimation from the imaginary to poetic language. Kristeva believes melancholia could be treated through the process of art making.

Kristeva returns to the importance of these unsymbolized areas of our psyche with the concept of *abjection* in the book *Powers of Horror* (1982).

A wound with blood and pus, or the sickly, acrid smell of sweat, of decay, does not signify death. In the presence of signified death—a flat encephalograph, for instance—I would understand, react, or accept. No, as in true theater, without makeup or masks, refuse and corpses show me what I permanently thrust aside in order to live. These body fluids, this defilement, this shit are what life withstands, hardly and with difficulty, on the part of death. There, I am at the border of my condition as a living being.³⁷

According to Kristeva, *abjection* refers to the human reaction (e.g. vomit, spit, horror) to the potential breakdown in meaning caused by the loss of distinction between subject and object, or self and other. The canonical example of abjection is a person's reaction to a corpse, which reminds them of their own mortality. Abjection is *in the process* - never the object or subject - and it is situated in "what existed in the archaism of pre-objectal relationship, in the immemorial violence with which a body becomes separated from another body in order to be."³⁸

Concretely, Kristeva describes the *abject* in the state of infancy. The infant cherishes the illusion of being part of their mother until the infant mentally and physically expels things which are not part of their self (e.g. spit, urine, etc). Infants develop a sense of themselves through this abjection and this process occurs even before the mirror stage of development - when a baby recognizes its reflection as itself. Prior to this abjection, the infant lacks any symbolic order of meaning or intersubjective community. Kristeva claims that the abject continues to haunt subject's consciousness, and this subjectivity is never settled.

The experience of the abject pushes us to a place where linguistic binaries (e.g. subject/object, and self/other) collapse, an ambiguous zone where the subject exists simultaneously in the pre-symbolic and post-symbolic worlds. This opens up an unknown space where there is no ability to make judgements about objects and others. For Kristeva, religion and art are a privileged space for abjection, and the best outcome yet. She believes that within the

³⁷ Julia Kristeva, *Powers of Horror: an Essay on Abjection* (Columbia University Press, 1982), 3.

³⁸ *Ibid.*, 10.

phenomenon of art, one begins to lose the ability to recognize between inside/outside, self/other, and strange/familiar. Kristeva's *abject* strongly influenced feminists and performance artists in the 1980s and 1990s, such as Cindy Sherman, Louise Bourgeois, Paul McCarthy, Gilbert & George, Robert Gober, Carolee Schneemann, Mary Kelly, Kiki Smith, and Sarah Lucas.

- **Art and film**

This section will discuss specific artworks which influenced visual, conceptual, and technical aspects of *Two Women*.

- *The Color of Pomegranates* (1968)

This film is a biography of Armenian bard Sayat-Nova, which attempts to capture the life of the poet poetically and visually using an experimental approach. The director, Sergei Parajanov, chose to deliver layers of color, textures, and sounds rather than a linear narrative.

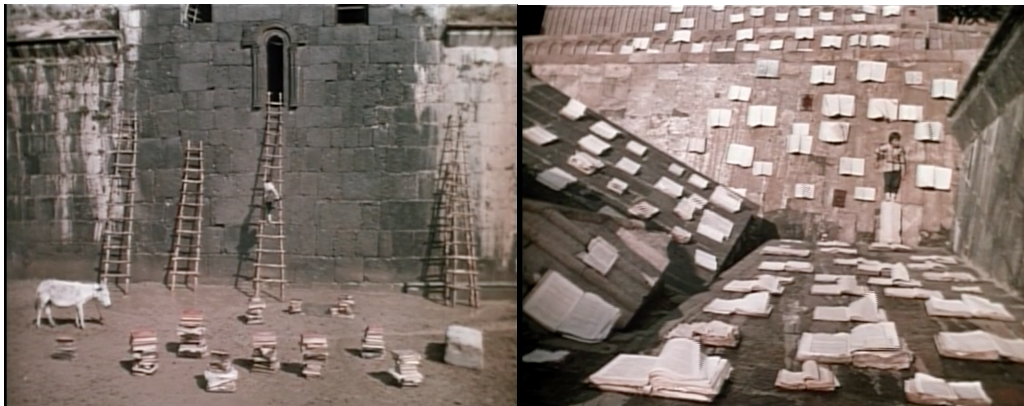


Figure 3.7: Sergei Parajanov, *The Color of Pomegranates* (1969), film stills

The opening scenes provided the strongest influence for the piece. While the voice of man speaks poetry, a series of montages appear sequentially: old books, water dripping on historical architectural elements, a young boy, and monks. There are no sounds other than the water dripping and speaking of the poem. In the next scene, the young boy brings old water-damaged books up to the roof of the monastery to dry. He flips the pages of a book and you hear a single gesture of sound. Later, a multi-layered soundscape is created from flipping pages and crumbled paper as the wind creates a dynamic visual of blowing through the pages of the books.

The crumbled, flipping sound of the paper carries an element of history and memory, which was employed in a standalone ambisonic sound study done previously to the piece. Elements of this study were used as a primary source of audio for the *Two Women* soundscape.

•*The Rothko Chapel* (1971)

This octagonal chapel was built for Mark Rothko's fourteen black paintings. The chapel was completed posthumously after Rothko committed suicide. The composition of the architectural space gives depth and dimensions to the paintings. The scale of the paintings and vertical composition create sublimity. The light of the chapel is truly inspiring, and brings out the understated color variations in the largely black canvases. For the project *Two Women*, the black color of *The Rothko Chapel*, the integration between art and architecture, and the effects of heaviness and rigidity all made their way into the configuration of the geometry of the containers, paper, and projection surfaces.



Figure 3.8: Mark Rothko, *The Rothko Chapel* (1971)

•*The Two Fridas* (1939)

Two Fridas sit side by side, hands clasped and gazing at us. The Frida on the left wears a traditional Tehuana costume. She holds a pair of surgical pincers to clamp off a bleeding vein. The Frida on the right wears a more contemporary Mexican dress and holds a small portrait of young Diego Rivera. We don't know whether the scene takes place inside or outside, in dream or in reality. The women look monumental, fearless, and resilient in front of the stormy sky. *The Two Fridas* is a double self-portrait of Frida Kahlo, painted right after she divorced from Rivera. The painting is one of the largest paintings she ever made.

Of particular interest is the concept of the “double.” In literature, doppelgängers usually represent the counterpart to the self, and the duality of human nature. In *Two Women*, this concept is explored in several different ways. The women have different temperaments, represent different generations, and cultural identities. They’re linked together by using the same actor in both images, the same environment, and the spatial arrangement of the machines.



Figure 3.9: Frida Kahlo, *The Two Fridas* (1939)

• *Life Study #5* (1996)

Richard Karpen's *Life Study #5* (1996) is an electro-acoustic music piece which explores a genre described by Karpen as "aural cinema". The piece is composed from some "ready-made" recordings, and augmented with musical excerpts from Bach which were synthetically realized and tampered with. A performance of the piece features a stage with no performers, but a series of speakers arranged in space. The composition is very unique because there are many recognizable sounds which are textured and layered, but they are repurposed and composed in a way to suggest a narrative. This piece was highly influential in the composition of the sound for *Two Women*. The audio for *Two Women* is designed to create a standalone narrative, but it frequently ties into the physical movement of the artwork itself to create an integrated whole.

• *A-line* (2015)

Juan Pampin's *A-line* (2015) is an ambisonic sound composition built around field recording from Buenos Aires. The piece forms an imaginary journey along subway line "A". The subway line holds a unique sentimental value to the composer as it was the site of his first explorations of the city as a child. The piece continues this journey with his young 5 year old son who participated in the gathering of the field recording. One of the striking elements in this piece is the transformation of space. You hear the sounds of wind, the rattling sound of train, speed, and voices of Pampin and his son. The discrete sounds are like snapshots of the journey, and you almost hear the transition and transformation from one place to another. Pampin used some techniques from the field of Music Information Retrieval to sync up scenes from one location to another, making links from disparate venues. *Two Women* uses similar techniques to bring together the rhythmic elements of the narrator with the punching sound of the machine.

• *Today, too, I experienced something I hope to understand in a few days* (2010)

James Coupe's *Today, too, I experienced something I hope to understand in a few days* (2010) is a web-based artwork situated inside Facebook as an "app". The work was displayed concurrently with the Abandon Normal Devices festival in England. Videos of festival attendees were shot using poses and actions loosely based on Danish filmmaker Jorgen Leth's 1967 film *The Perfect Human*. The videos were uploaded to a database to become a corpus of material from which to create algorithmic compositions. The system also downloaded status posts from the Facebook users who installed the app and synthesized narratives by concatenating several different status posts. Then the system used keywords from the generated narratives to download

additional videos from YouTube, to edit together with the festival portraits, and the generated narrative as subtitle, in a split screen. The piece is very interesting from an algorithmic narrative perspective. *Two Women* is part of extended line of research on using databases of videos, text, and sounds to build out installations which are non-linear, generative, and eschew loop-based presentation.

3.4 Preliminary Process

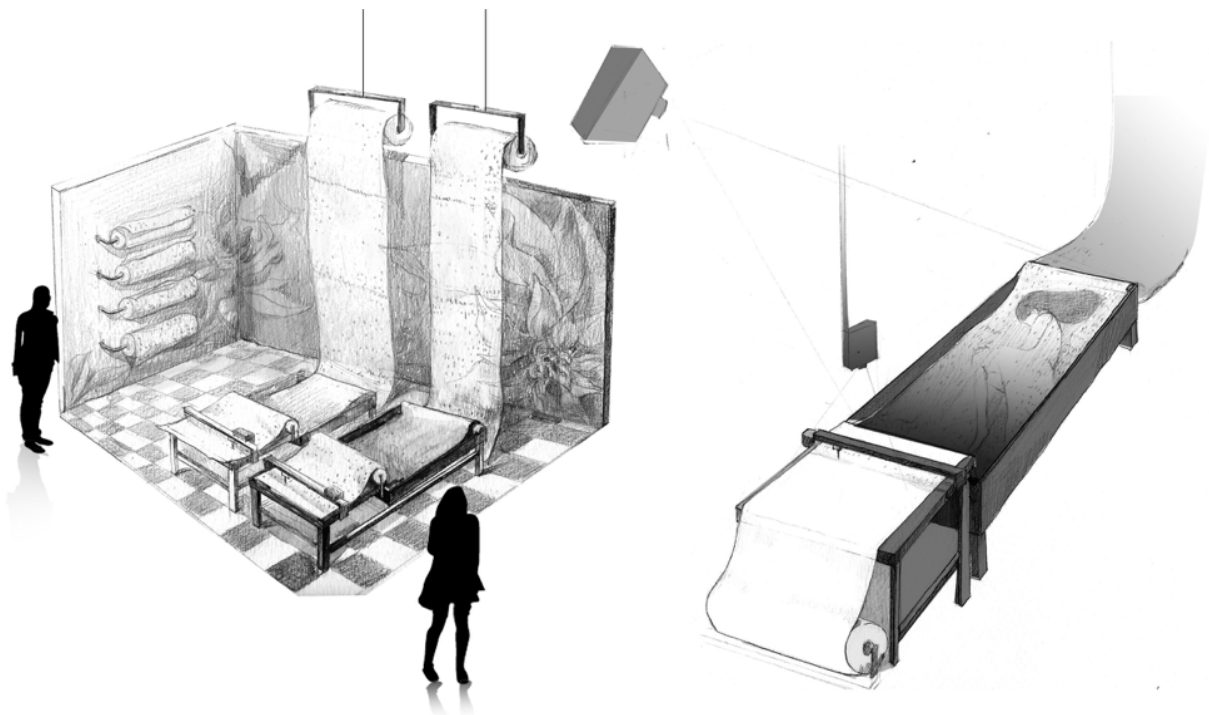


Figure 3.10: Ha Na Lee, *Two Women* preliminary sketches (2013)

Two Women's complexity was greater than could be tackled by a solo artist. The fabrication and mechanics, software systems, film shooting, costume design, and writing all required working with domain experts to bring the whole project together at such a high level of polish. Each area of pre-production required many experiments in order to form the basis for effective communication with the collaborators. Work was segmented into five main production areas: writing a short narrative, audio/video production, fabrication, control system design, and composition.

- **The narrative about the old woman**

The fictional story was written by playwright Sang Hun Lee, who is my brother. The collaboration began very naturally as I could openly discuss with him about our grandmother, and the subjects of suicide and death. We came up with a narrative of an old woman sitting in a room where she sees a surreal experience of her death. Because the story starts and ends in a room, I planned to visually represent the room, and recreate her dream sequence. (see fig. 3.10) Two identical physical machines are placed against the backdrop of distressed wall paper. The room glows in dark while the sounds of the punching machine is tabulating enigmatically on the roll of paper. The story is structured into four independent chapters so an audience doesn't need to experience the narrative in succession. The chapters were originally written in Korean and translated into English.

Finding the right voice was very crucial to the piece because the disembodied female voice in the room sets the tone of the installation and draws the audience in. Research for the writing included studying films which include a strong female role and voiceover, such as *Poetry* (2010) by Chang Dong Lee, *Vivre Sa Vie* (1962) by Jean-Luc Godard, *Cries & Whispers* (1972) by Ingmar Bergman, etc. Kyung-mi Han, the voice actor, proved to have just the right type of voice for the piece; soft, fragile, whispering, and at the same time determined.

- **The experience of underwater video shooting**

The central idea for this piece stemmed from one image. *Two Women* came from a single image of a woman dressed in white laying down in a deep dark pool of water. From this single image flowed an abstract narrative which developed into a sequence of images for shooting. The sequence required slight movements of water with shadows casted over the body - a very quiet image. The learning curve for shooting underwater was steep, and the production budget was tight. Technically, shooting underwater required extensively learning about ways to light inside the water, the procedure of shooting, and the choreography of gestures.

Working closely with the cinematographer was crucial. From previous experience, the best way to communicate with the cinematographer was to share and discuss as many related images as possible. All of the shots had to be accomplished within a single take due to the fixed perspective of the viewer (i.e. looking down into the water) and the need for continuous shots to make each shot more believable. Storyboards (see fig. 3.11) were developed specifically for this

scenario, departing from the usual format of cut-based timelines. Working from a rough estimation of the voiceover duration, the sequence of gestures was created accordingly. Some of the gestures couldn't be realized in the end because of the principle of buoyancy.

The pool where the video was shot was 5 meters deep. The actress wore a weighted diving belt so she would sink to the bottom of the pool in order to get her full body shot (see fig.3.13). Working at this depth and for the duration of the shooting had many limitations. For example, the shot durations were limited by the fatigue of the diver, the timing of breaths, difficulty communicating with the cinematographer, the type of equipment which was available, etc.



Figure 3.11: Ha Na Lee, *Two Women* selected storyboard images

According to the Korean tradition, up until the 19th century the death shroud for a woman was her bridal wear. Min-gyu Kim, the costume designer, adopted the pattern from a traditional bridal gown, a *han-bok*, and simplified it for the costume (see fig. 3.14). We experimented with a number of different fabrics and lights underwater. To achieve maximum contrast and dynamic range with the black backdrop, a diaphanous white fabric was used, which is super thin and very light permeable. The dress consisted of many layers of silks which had a good floating effect inside of water.



Figure 3.12: Left - Production photo, voiceover recording in process, Seoul, South Korea, 2014
Figure 3.13: Right - Production photo, underwater shooting at Ansan Marine Life Center, 2014



Figure 3.14: Production photo, *Two Women* costume (2014)

- **Prototype of punching machine**

The punching mechanism took several major iterations to get right. Initially the punching machine was meant to be loud and violent. The first iteration was built using a pneumatic roofing nailer. The nailer had several drawbacks, which included the overall bulkiness of the puncher, hose management, and the loudness of a compressor. For practical reasons the puncher was switched to a solenoid in order to simplify things and prove out other aspects of the installation. At this point it wasn't decided whether to abandon the nail gun approach, but it was important to get an end to end system working, even if it would be radically changed as the installation took

shape. The rough prototype (fig.3.15) was only capable of creating a two foot wide scroll, but it served its purpose as a testing ground, and it was possible to explore many aspects of the system such as how the punched paper would look, what types of paper would work well, how much torque would be needed to draw the paper through the entire installation, the encoding of the punches, the linear rail, etc.

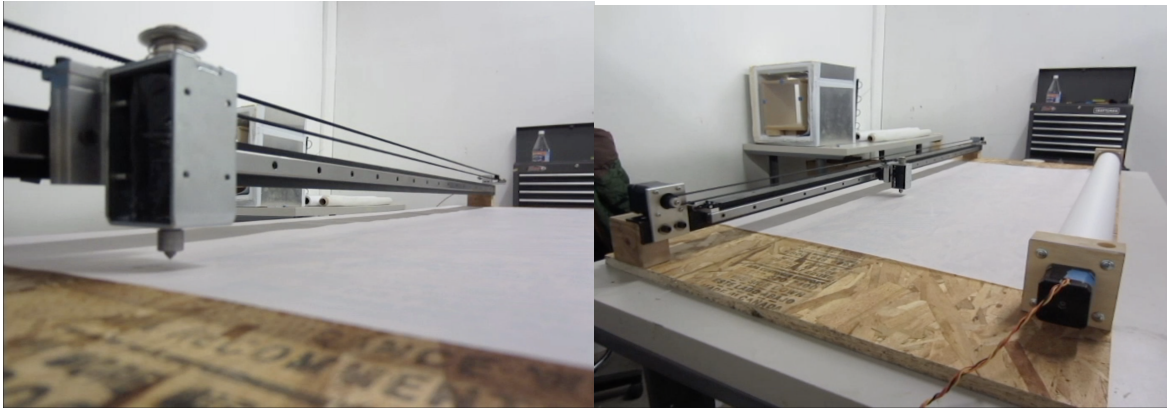


Figure 3.15: Prototype machine, punching mechanism, Seattle in 2013

Not knowing what the female voice would sound like at this point, we had to imagine the layers of sound for both a female voice and the punching sounds together. The punching sounds had to be considered sonically as a part of the whole soundscape, so quite a bit of experimentation went into testing the timing, spacing, and force of the punches, as well as the speed of movement of the linear rail. Each punch was divided up into 5 discrete movements, which could individually be composed: downstroke, pause in the down position, upstroke, pause in the up position, and movement to the next punching position.

The sounds produced by the punching machine were recorded with a contact microphone to be used for sketching and layering sounds as well as for compositing into the soundscape in the final installation.

- **Material experimentations**

Finding the right paper was the most difficult task, since the paper had to have enough strength to get covered in holes, and then soaked in water for at least 10 minutes. Originally, the pool of water was meant to be steeped with something like tea which would patinate the paper. The paper would be transformed throughout the process. Several textures, weights and transparencies of paper were tried. Inks, caramel color, dyes, and tea were all tested against fresh

and punched paper (fig.3.16). Projection tests were performed against promising candidates (fig.3.17).

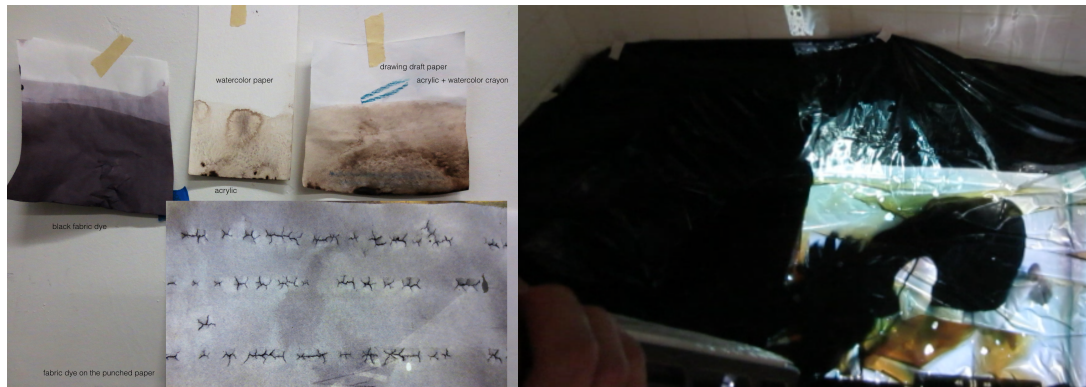


Figure 3.16: Experiment with papers and dyes | Figure 3.17: Projection tests with water, 2013

Unfortunately, there was no cost-effective traditional pulp-based paper which could withstand the water and be purchased in long rolls. Some very expensive printmaking papers might have worked, but given the budget and run-time of the installation they were deemed inappropriate. Tyvek, which is a plastic-based paper, proved enough to withstand both the punching and submersion. White colored Tyvek is widely available as a construction material, but it was determined white paper destroyed the illusion of depth in the pools. Black Tyvek was selected as the final material, since it provided a high-contrast, low-glare projection surface. It also created a strong sculptural presence, while fitting the somber mood of the piece.

- **Composing the punches**

The main purpose of this experimentation was to visualize differences between various ways of encoding data and/or noise as punches. At this point it had not been decided that only news articles would be encoded as punches. Other systems considered the punches as frequency data related to the average time between suicides. Random punches were also considered, so as not to distract people from the content of the narrative with additional layers.

Due to the time involved in physically punching holes in paper a shortcut was needed in order to iterate quickly on the visual design. A simple graphical user interface (GUI) was written in SuperCollider to visualize the effect of a sequence of punches on-screen. The system could translate Korean and English into Morse code and visually display the Morse code as dots and spaces. The program had controls for loading data, and choosing parameters such as hole size, spacing and how much data to output. The program also had a simple serial interface to drive the

punching machine, but wasn't built to withstand hours of machine control (e.g. handling spooling of large data sets, responding to limit switches, etc). Figure 3.18 shows a screenshot of the graphical user interface for three different data sets along with a data visualization system. The right image shows the first successful punched paper prototype.

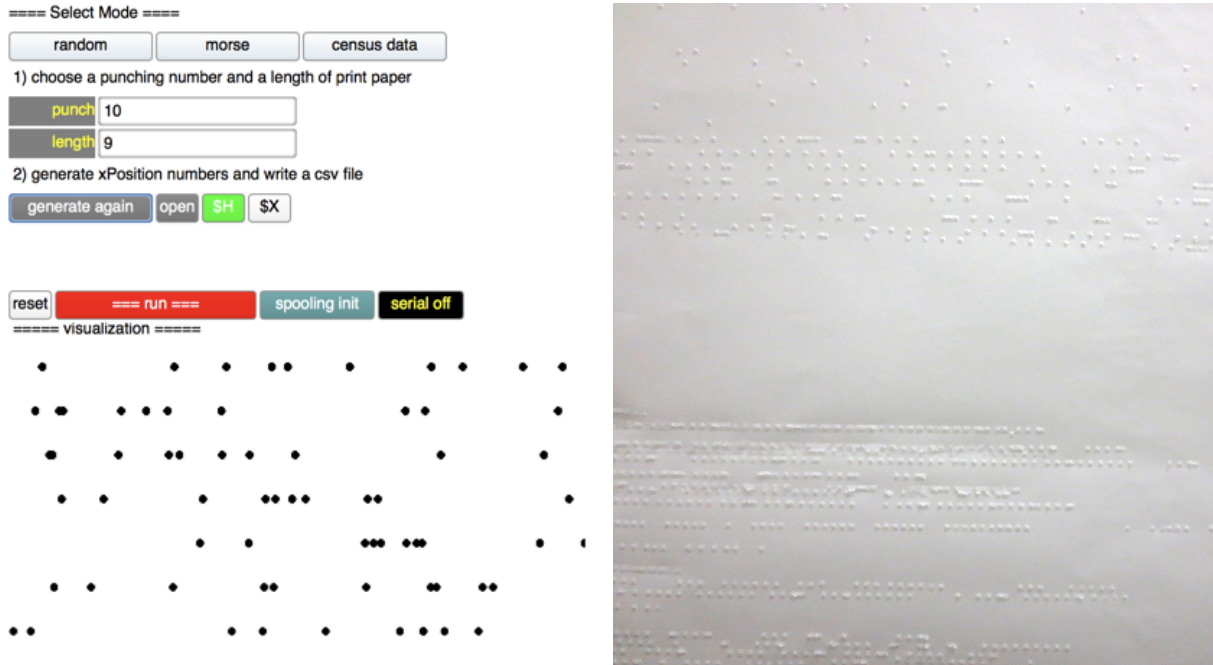


Figure 3.18: Left - a screenshot of the SuperCollider GUI | Right - punched paper prototype

3.5 Art Methodology

While *Chapter 2* is mainly concerned with the historical and theoretical contexts in the relationships between art and cinema, this section addresses the artistic concerns and research intentions related to the execution of *Two Women*. The starting point for this research came from questions about the differences and similarities between cinema and installation video. Fundamentally this research is grounded in a time-based art practice, and an understanding of how the representation of time occurs in an artwork. In particular,

- How can a video installation utilize space?
- How does the representation of time occur through artwork in physical space?
- How does imagery achieve an embodied experience?
- How is narrative conveyed in an installation situation?
- What are the methods for incorporating media technology in order to expand the viewing experiences in an installation?

The book, *Death 24x a Second; Stillness and the Moving Image* by Laura Mulvey raises an interesting point about the relationship between viewers and films. As Mulvey noted,

At the end of the twentieth century new technologies opened up new perceptual possibilities, new ways of looking, not at the world, but at the internal world of cinema. The century had accumulated a recorded film world, like a parallel universe, that can now be halted or slowed or fragmented. The new technologies work on the body of film as mechanisms of delay, delaying the forward movement of the medium itself, fragmenting the forward movement of narrative and taking the spectator into the past.³⁹

Mulvey seems to assert that new technologies unlock a way of accessing the temporal structure of cinema, which eventually lets the viewers control the core structures of a narrative. Instead of watching from beginning to end linearly, by using media technologies the audience can pause, rewind, fast forward and repeat the film any way they want. This way of viewing experience is progressive, interactive, and eventually alters the whole relationship between viewers and films. Spectators today exhibit and curate their own unique way to approach the narratives of films, whereas spectators before the development of media technology could only

³⁹ Laura Mulvey, *Death 24x a Second; Stillness and the Moving Image* (London: Reaktion Books, 2006), 181.

gaze passively. This argument is particularly fascinating because this inversion of the control and experience of time makes the audience active *subjects* in the fabric of cinematic time.

Two Women endeavors to build *situated cinema*, a space where the spectator's experience is somewhere between installation, theater, and cinema. Situated cinema supports a non-linear narrative, occurs in physical space, and adapts to the audience's participation.

Traditionally, nonlinear narratives in cinema jump back and forth temporally, and potentially spatially as well. Although the narrative is nonlinear, the experience of the movie is linear. The film has a beginning, middle, and end. The director can rely on the sequence of cuts to build into an overarching gesture. The film may be nonlinear, but it can still be tightly composed. In the context of new media, non-linear may mean the entire sequence of video is dynamically generated having no beginning or end. Situated cinema intrinsically adds an extra dimension of non-linearity. The *experience* of the piece becomes a nonlinear element, as the audience can enter and leave the installation at any point. In a sufficiently dense environment, the audience's attention can only be fixed on a limited portion of the installation, thus missing anything else going on in the space. A successful narrative must be robust to the transient audience and wandering gaze. The narrative needs to be built on top of the strengths of the medium.

The possibilities of cinematic sets situated inside of a gallery create an interesting boundary between the real and surreal. The experience of time should not be timeless, but aware, eventful, and dynamic. Two previous projects, *Vestiges, part II* (2013) and *Shadow of Sounds* (2011-2012) solicited the audience's direct interaction. Through sensors and motors, the narrative arc was shaped, progressing as the participants moved through the space triggering the next scene. The unpredictable behavior of the audience proved to be a weakness of this sensor-driven approach. A crowded installation ruined any usefulness of the sensor data. Some members would linger in one section of the installation, while others walked past triggering the next clip and ruining the progression for the laggards. Other audience members would walk through the installation backwards. *Two Women* eschewed interactivity in favor of a temporal structure which could be experienced from any point, relying on haptic visuality and embodied vision to draw the audience into the narrative.

The size and shape of the machines and their location next to each other evokes a monument, or a grave. The locations of the projected images force the audience into a specific

location and posture for viewing which reinforces the funerary theme. The physicality of the machines, the water, the room, and the soundscape all work together to create an embodied vision - something beyond a purely audio-visual experience.

The human scale projection of the submerged figures, proximity to the viewer, and use of water as a screen aims to create *haptic visuality*. The reflections on the surface of the water, mixed with the lensing effects as the water moves, and the projected images under the water provoke a feeling of a tangible and textural object to be touched.

The final result of this research feels both positive and negative. There were some good results, but there are areas that could still be developed and explored further. In Project Documentation, *Two Women* is methodically analyzed and experimental results reported. The following writing unpacks these results into five sections: Fabrications, Electronics, System design, Narrative/Composition and Video/Sound.

3.6 Project Documentation

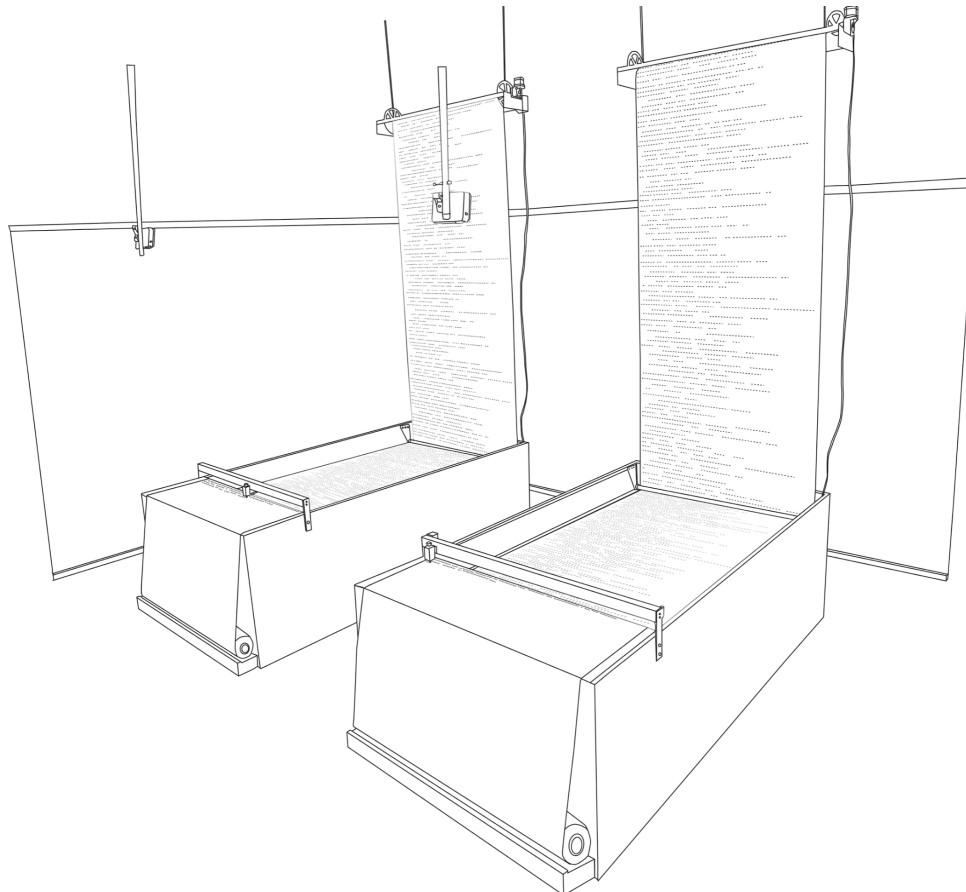


Figure 3.19: Ha Na Lee, *Two Women* installation diagram

- **Fabrication**

The physical configuration of *Two Women* consists of a freestanding L-shaped wall covered with wallpaper, a dark carpet floor and two identical kinetic machines. Each kinetic machine has a spool of black paper. The paper runs from the floor in front the machine up to a short tabletop and then passes under a linear rail, which positions the punching tool horizontally. After being punched, the paper gets immersed into a pool of water and finally pulled up to the ceiling where a spooling mechanism collects it.

The walls have a dimension of 16' wide x 12' deep x 8' high enclosing 192 square feet of space. The floor is covered with dark grey industrial carpet. This type of carpet was selected for its extreme low contrast, and ability to disappear in the dimly lit room. The walls are covered

with a floral print wallpaper, which is heavily treated to create the impression of dilapidation.



Figure 3.20: *Two Women* wallpaper

The paper is torn in sections revealing a concrete-like texture beneath. The wallpaper is constructed in 27” wide sections which can be rolled up for portability and storage. These sections can be rapidly installed with a staple gun for subsequent exhibitions. The wallpaper is permanently mounted to a Tyvek substrate. Tyvek was chosen for its durability and resistance to tearing. After sections of the wallpaper were torn away, the holes were covered with a mixture of stucco and molding paste. Stucco provides the proper texture to simulate poured concrete, the molding paste is a strong binder while providing the flexibility needed to roll up the sections. Without the molding paste, the stucco would just crack and fall off the Tyvek. The whole surface

of the Tyvek-wallpaper-stucco laminate is painted with various dilutions of black acrylic paint to make it look dirty, moldy, and old.

The original concept for the machine bodies called for the pools to be constructed out of metal. Due to the combined cost of fabrication and transport from Seattle to Santa Fe, the design was adapted so the main materials could be easily sourced, cut, and constructed at the exhibition location. Drawings (fig. 3.20) and a cut list were sent to the festival and the festival provided a carpenter to assist with fabrication in Santa Fe.

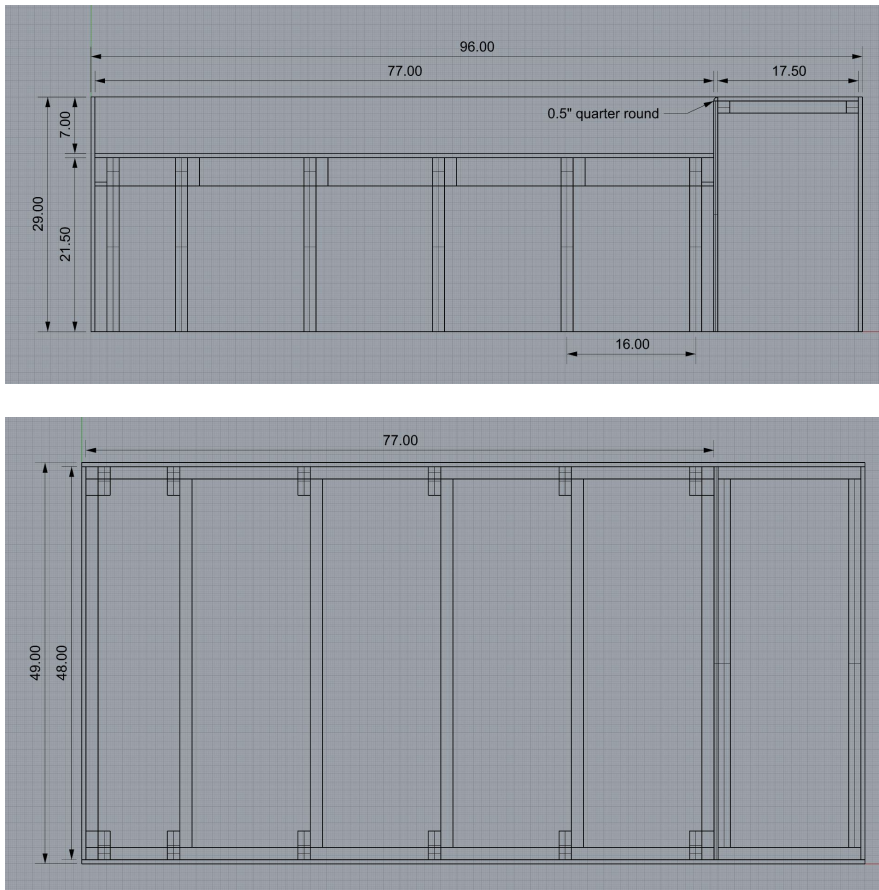


Figure 3.21: CAD elevations of the machine bodies

The body of each machine is constructed out of $\frac{3}{4}$ " plywood and 2"x4" construction. The outer dimensions of the boxes are 49" wide by 96" long by 29" high. Each box has a 17 $\frac{1}{2}$ " top at the front of the box, which provides a projection surface for the subtitles projectors, as well as a hard surface to support the paper while it is being punched. The tabletop has a $\frac{3}{16}$ " x $\frac{1}{8}$ " groove cut in the surface which runs under the path of the puncher awl. This groove functions as a relief

cut beneath the paper where the point can puncture through the paper without having to also punch into the wood. The puncher awl has a shoulder which is slightly wider than the width of the groove which provides a positive stop to the solenoid piston extension and keeps the point from getting wedged in the groove. The tabletop is routed with a ½” round-over bit on the front and back edges to eliminate sharp corners where the paper runs over the edge.

The portion of the machine body which is filled with water is recessed 7 inches. The decision to make the pool 7 inches deep was motivated by the structural concerns of making the pool too deep. Filling this modest reservoir with only 4 inches of water results in over 530 pounds of weight. It was important to have the top of the water close to the top of the body of the machine so the projected figures in the pool would appear to be within reach for the audience. The recess was framed in accordance with standard wood wall framing techniques with studs and joists every 16 inches.

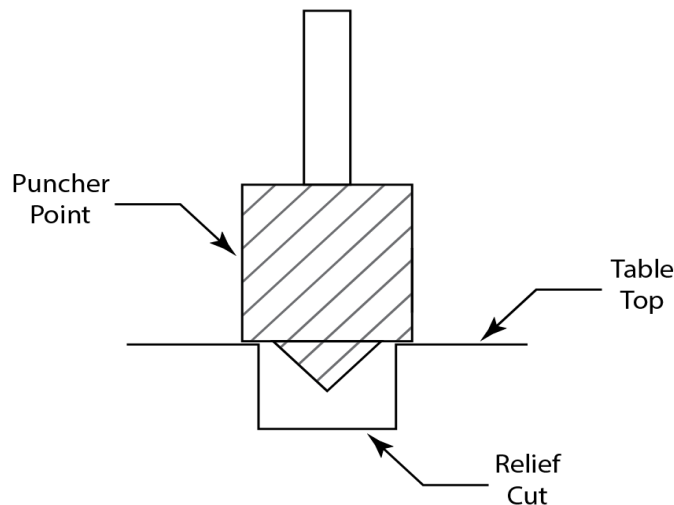


Figure 3.22: detail of the puncher awl and it's relationship to the relief cut groove in the table top.

The front panel of each machine was designed to be easily removable by unscrewing a few screws. This removable panel provided access to the computers, networking equipment, and all the necessary power supplies and electronics which were hidden inside the bodies of the machines.

The spool of paper for each machine sits on a small wooden pedestal which has two main functions. The pedestal keeps the spool from being accidentally kicked away from the machine.

The pedestal also covers a small slit cut in the bottom of the front panel of the right machine to provide access to the main Mac Mini running the installation, and also a network cable which can be used to connect a laptop to any of the computers in the installation, either by SSH or VNC for the purposes of calibrating or troubleshooting the installation.

The installation height of a spooler machine is variable, though a minimum height of approximately 10 feet preserves the desired proportions. The installation at *Currents: The Santa Fe International New Media Festival* had a height of 17 feet, while the installation in Seattle was just under 12 feet. Higher installations of the spooler mechanism create a more monumental presence.

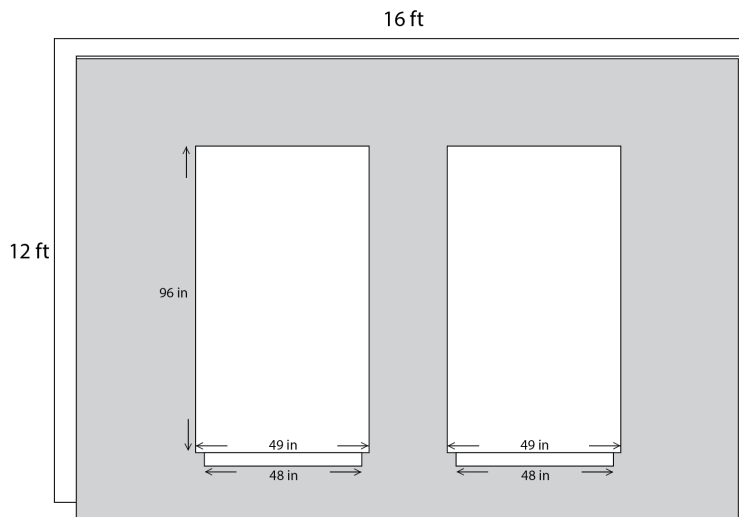


Figure 3.23: *Two Women* diagram top view

The punching system shares a lot of its design with contemporary CNC machines such as 3D printers, or CNC routers. The main horizontal structural member of the punching system is constructed out of wood to minimize the industrial look. To the wood beam, a conventional off-the-shelf linear bearing rail is mounted. The block on the linear rail has a custom made bracket with the solenoid attached.

The solenoid has a custom made puncher awl affixed, and custom made dampener to silence the piston when the solenoid is de-energized. The method for powering the solenoid is somewhat novel. To either side of the linear rail 3/16th inch metal strips (Table 3.1 f20) are inlaid into the wood running the length of the wooden beam. These metal strips are the positive and negative rail used to power the solenoid. The wires to the solenoid are attached to a pair of

spring loaded electric brushes which bridge the electrical gap between the block and power rails. The brushes, brush housing and spring were adapted from cheap DC motors. This design is similar to that of slot cars, where the power transmission to the toy car's motor is by physical contact with the track it's traveling over. The design was motivated by aesthetics. A prototype used a conventional cable carrier and wires to provide electricity to the solenoid, but the contraption visually dominated the punching mechanism.

The linear rail block (Table 3.1 f19) is positioned by a timing belt which is driven by a stepper motor. A lead screw was considered for this purpose since it would have further reduced visual clutter, but the belt drive won out because it could move the solenoid around more quickly and be easily positioned by hand when the stepper motors were unpowered. A limit switch (Table 3.1 f13) at one end of the linear rails provides a mechanism to "home" the punching system when the whole machine is started up. This homing routine assures the punches are punched at precise distances with respect to the location of the limit switch.

The pool system consists of two paper hold-down bars (Table 3.1 f24, f25) and a waterproof pond liner (Table 3.1 f23). The hold-down bars function to keep the paper submerged under the water. The hold-down bars are positioned an inch above the bottom of the pool, and an inch away from the front and rear pool walls. The hold-down bars couldn't be attached to the pool walls through the pond liners in order to maintain leak integrity. Instead, the bars are mounted to brackets which allow the bars to be screwed into the sidewalls of the pools above the top of the pond liner. The hold-down bars also have a pair of sliding locking collars which must be positioned snugly against the edge of the paper to help keep the paper aligned as it moves through the system. These locking collar guides crucial to correcting the small alignment errors which accumulate due to imperfect construction, setup, and misalignment of the machine bodies and spooling systems.

The pond liner was purchased from a commercial provider of custom sized pond liners and sized 48 x 77 x 7 inches to fit the interior of recessed pool area of the machine body. Early approaches to creating the pools included painting the inside of the wooden pool with various waterproofing products, and constructing the pool from heavy duty polyethylene plastic sheeting. The plastic sheeting was prone to small punctures. The waterproof coatings were not chosen due to concerns about maintaining the waterproof integrity at the joints between faces, and the exorbitant cost of the coatings. The pond liner is extremely heavy duty, removable, reusable, and

can be folded and rolled up compactly for shipping. Additionally, the surface is relatively matte black which helps it disappear in the installation.

The spooler system is constructed out of a simple 80/20 brand aluminum extrusion frame and bolts together. The frame (Table 3.1 f7) is hung from the ceiling by black parachute cord (Table 3.1 f9) at 4 corners. The rigging is made from one continuous piece of parachute cord such that tension on the frame from the paper pulling downward causes the frame and spool to self-level.

The spooling system is driven by a stepper motor with 30:1 worm gear reduction. The worm gear system (Table 3.1 f5) cannot be back-driven so the system maintains tension on the paper even if the stepper motors are powered down. The worm gear and stepper came as a single pre-packaged unit and included a drive axle. The motor is bolted into the gear reduction unit. The gear reduction unit is bolted to a custom made aluminum bracket, which bolts onto the spooler system frame. The drive axle was milled into a hexagonal profile at one end and fitted with a hex hole sleeve. The hex hole sleeve slides over the mating hexagonal profile on the drive shaft of the spool and acts as a coupler between the gear reduction and the spool. This design makes it very simple to engage and disengage the motor from the spool, without tools, to swap out the spool, or make adjustments.

The spool itself is an entirely custom made construction. The main body of the spool is made from aluminum tube (Table 3.1 f2). The tube is capped at both ends with press-fit caps, with one end having the aforementioned hexagonal bar stock sticking out about ½ inch. The tube has a ¼" x 1" slit cut on both side of the tube, in the middle of the tube (Table 3.1 f3). The Tyvek paper is fed through this slit when starting the spool to create a strong positive lock on the paper so it doesn't slip on the spool. The flanges (Table 3.1 f1) are milled out of black Star Board, which was chosen for it's ease of milling, durability, and waterproofness. The flanges simply slide onto the end of the tube and are held in place by locking collars at either end. The locking collars also function as raceways for the support bearings which support the entirety of the weight of the spool. When the spool is installed the locking collars must be adjusted to precisely position the raceways over the bearings. The spool is just cradled by a pair of bearings on both sides. The only thing which really holds the spool in place is the tension of the paper pulling downward, keeping the locking collars firmly seated on the bearings. By disengaging the hex hole sleeve (Table 3.1 f4), the spool can be rotated freely, releasing tension on the paper. Once

the tension is released the whole spool can be easily lifted out of the spooler system frame for replacement, repair or disassembly.

The spooler frame has LED light strips (Table 3.1 f8) mounted on the back underside to illuminate the paper from above. Illuminating the paper provides both a backlight so the punched holes can be seen from the front, and also accentuates the texture of the punches themselves when viewed from the rear. The light strips are shaded by black foam core panels to focus the light downward, so the light doesn't leak onto the walls or shine directly into the eyes of the audience. Getting the color temperature right for these lights required mixing cool white and warm white strips, though the results weren't perfect. A future improvement would be to use tricolor LEDs and adjust the light temperature to get the right feel.

The black tyvek paper used in the installation is 48 inches wide (Table 3.1 f10). Each roll is 375 feet long. Figure 3.23 demonstrates the entire transport route of the paper through the installation. Gravity, friction, tension and rolling action of the roll are all crucial to correct movement of the paper. The fresh roll of paper at the foot of the installation is mainly held in place by the rolling action of the roll as the paper is being pulled upwards onto the machine body. The friction caused by the table under the puncher, and the 4 right angle turns of the paper as it moves through the system is important to keep the paper taut and smooth, as well as submerged beneath the water (Tyvek floats). The tension on the system also creates a visual tension since you can actually see the stress on the paper.

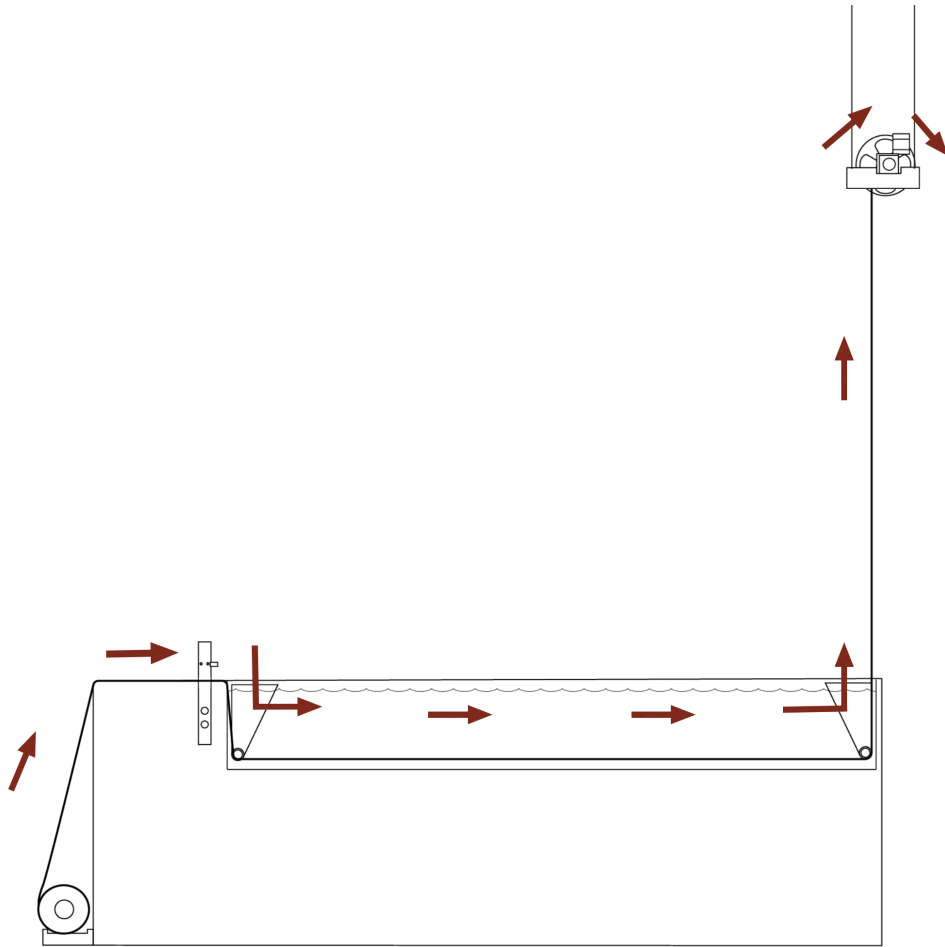


Figure 3.24: *Two Women* diagram side view with flow direction

Fabricating the parts for *Two Women* involved a lot of mistakes and experiments. The design complexity was compounded by a desire to make the system visually clean and non-distracting, a need to make the system portable, and easy to assemble/disassemble. Common maintenance tasks and de-installation had to be performed by a relatively non-technical exhibition docent.



Figure 3.25: Photo documentation; disassembled machine parts

- **Electronics**

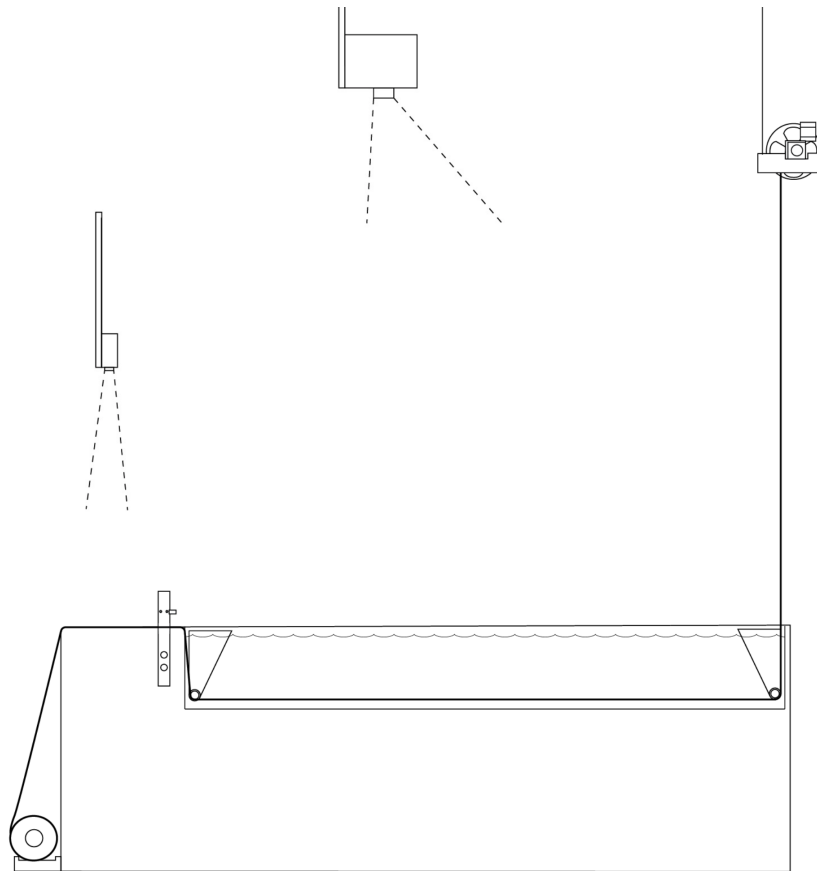


Figure 3.26: *Two Women* diagram side view with video projections

Each machine has two video projections. Figure 3.25 demonstrates the location of the projectors in relation to the machine. The pico projector (Table 3.1 f35) is hung 70 inches above the punching table and only projects subtitles. The other projector (Table 3.1 f34) casts full 1080p HD size video clips into the pool of water.

Each projector has a dedicated Raspberry Pi 2 (RPi)(Table 3.1 f27) running custom software written in C++ to play the video. The RPis were networked together with ethernet. The RPis run the subtitles received to display via Open Sound Control (OSC) and had no local store of text. The computers running the HD projectors had a local store of pre-rendered video clips on a flash drive and received OSC commands which told them which video to play.

The main composition was written in SuperCollider running on a Mac Mini and networked to the rest of the installation. SuperCollider generated the sound and used OSC to send commands to the video players and the punching machine. A collection of shell scripts was used to start up the various subsystems and to reboot and shutdown all the machines in the

installation. Each part of the system could be easily controlled from the Mac Mini by an exhibition docent in the event of system problems.

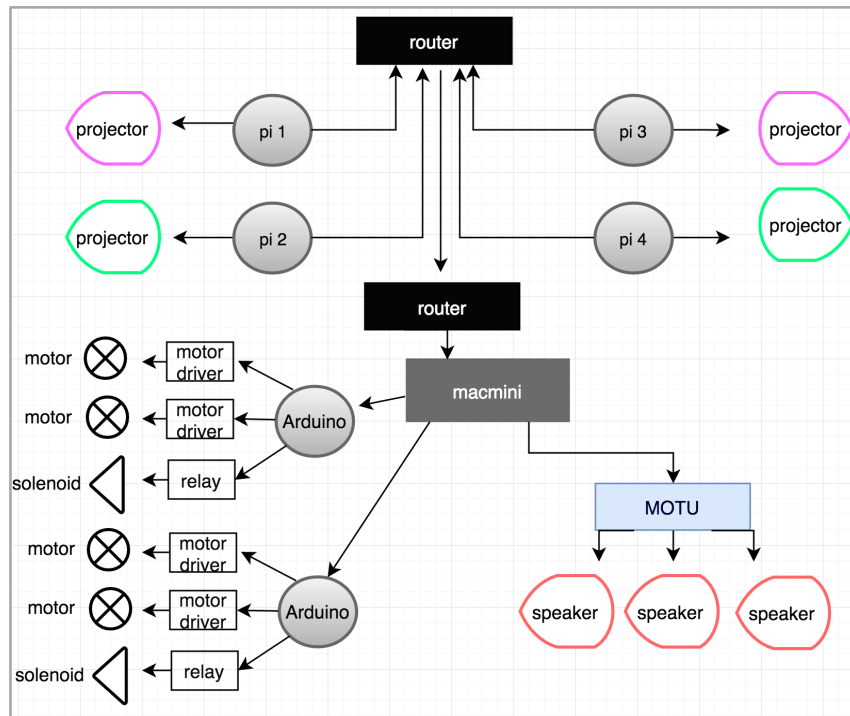


Figure 3.27: The diagram of electronic device connections

Despite the power and convenience of the RPIs, the non-subtitle video playback had some technical problems. Every once in awhile the videos would inexplicably freeze, probably due to a bad interaction between the OMXPlayer firmware and the video encoder used. Also the SD Card throughput on the RPIs is severely limited, which resulted in a noticeable gap between sending a command to start playing video and when the video actually started to play. During this gap, the last frame of the previous video would be frozen. The gap was probably less than a second but it had the effect of breaking the immersive experience of watching the video. The RPI is capable of full frame rate 1080p video, but to achieve this performance the videos have to be compressed in a way which leads to quite a bit of compression artifacts and loss of clarity. Due to these problems, the RPIs were replaced with Mac Minis for HD video playback for the installation in Seattle.

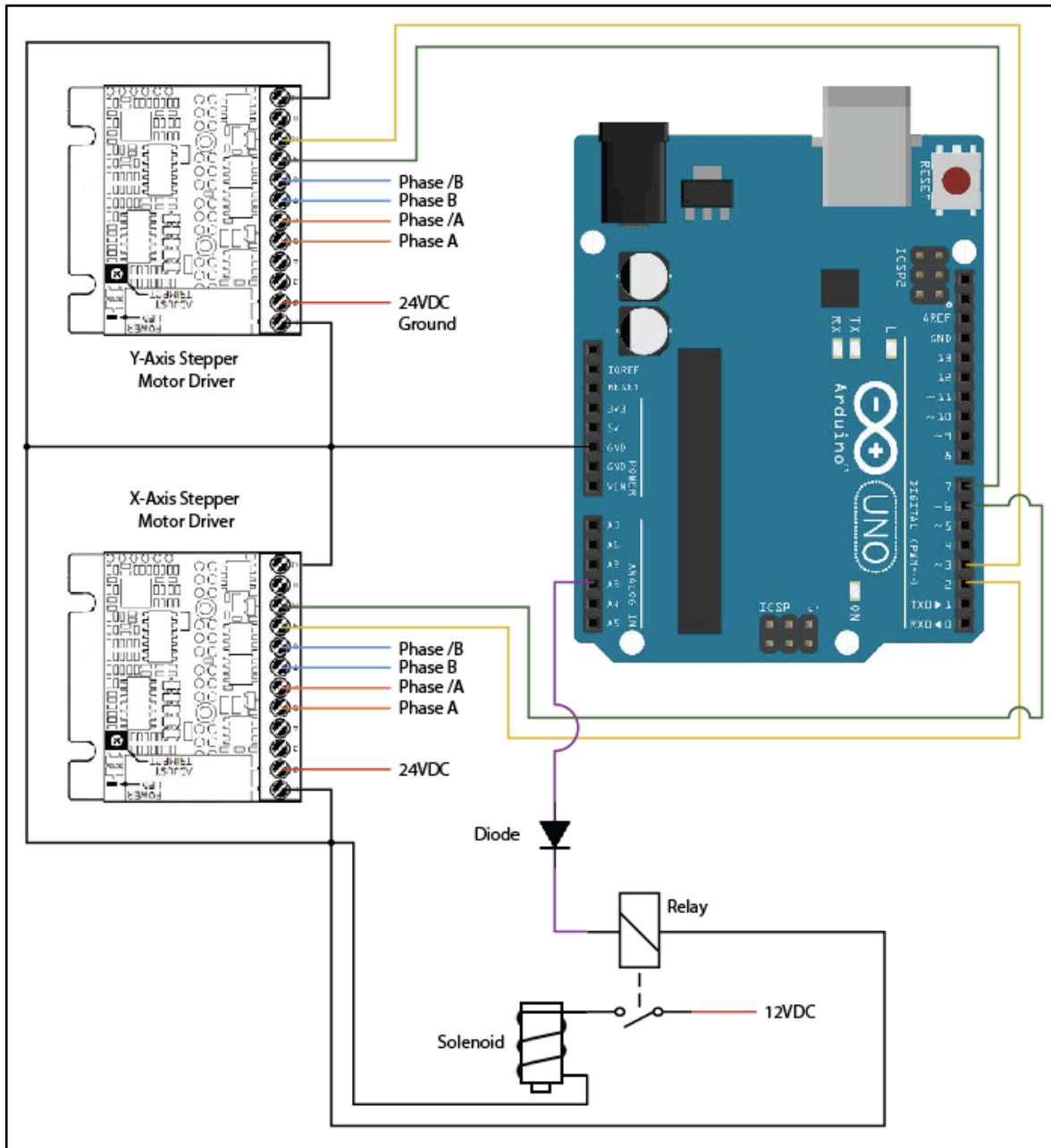


Figure 3.28: Circuit diagram

The festival in Santa Fe provided four single channel speakers and one subwoofer. The speakers were installed on the top of the “L” shaped wall so the voice would be coming from above the audience. The sound was dispersed equally from all four speakers, while the narrator’s voice came only from the 2 center channels.

In the Seattle installation, three higher quality speakers were installed at the same height in a triangle configuration. The speakers were angled downward so the sound was more directed towards the audience's typical location at the foot of the two machines. The narrator's voice was placed in one speaker while the ambient sound was spatialized through the other two. The change in configuration didn't have a strong impact on the experience, but the overall loudness

and clarity of the audio was much better.

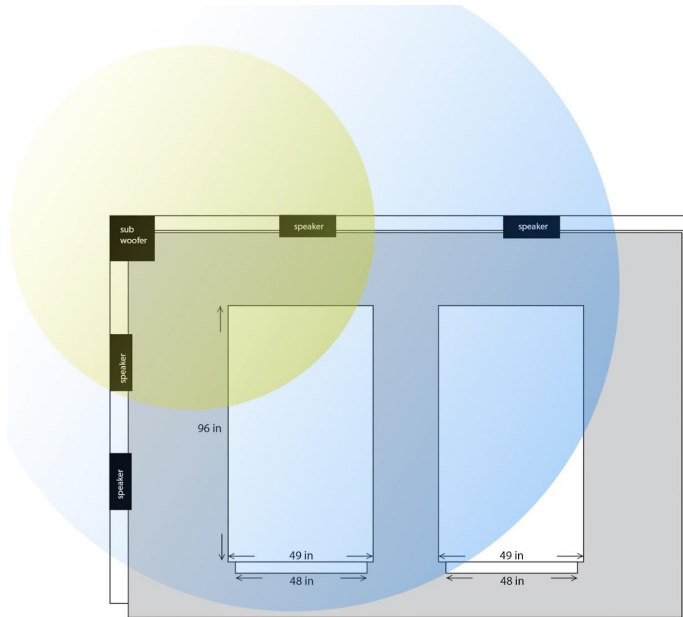


Figure 3.29: *Two Women* speaker locations.

Top - five channel speaker setup at *Currents The Santa Fe International New Media Festival* in Santa Fe.

Bottom - three channel speaker setup at DXARTS Ballard warehouse in Seattle

The yellow circles indicate the location of the female voiceover.

Blue circle indicate the position of the ambient soundtrack.

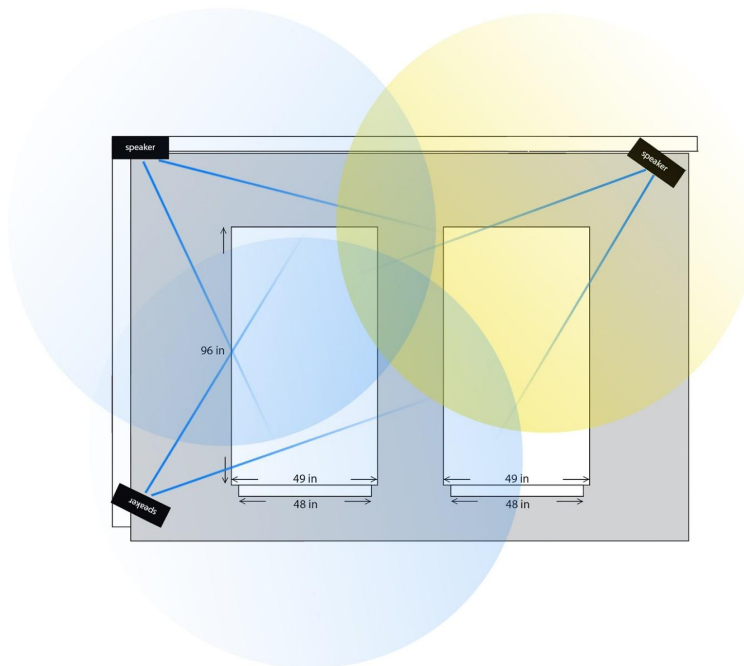
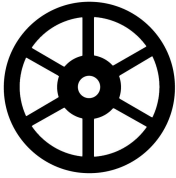
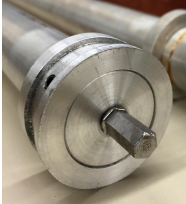
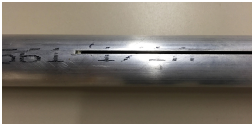
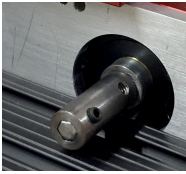
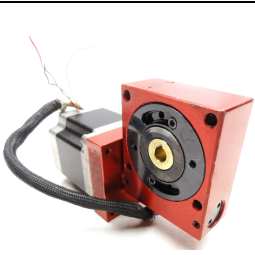
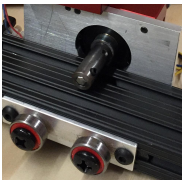



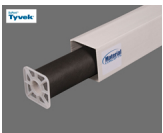

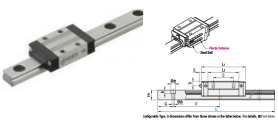
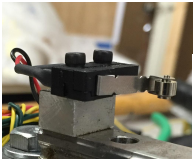
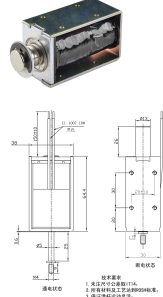
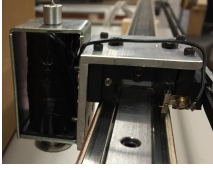

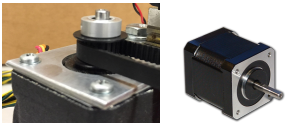



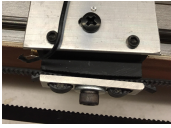
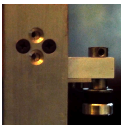



Table 3.1: List of fabrication and electronic

Category	#	Name	Image	Dimension /Total	Material	Description
Spooler System	f1	Spool Flange		outer circle: 8 inch Inner circle: 1.02 inch Total = 4	StarBoard	Custom made Flange to guide the paper onto the spool
	f2	Drive axle and locking collars		Shaft length : 0.5 inch Total = 2	Aluminum, Steel	Custom made hex drive axle, locking collars with integrated bearing races.
	f3	Spool shaft		Shaft length: 47 inch Diameter: 1 inch Total = 2	Aluminum	The pole has a slit cut in the middle for locking the tyvek onto the shaft.
	f4	Hex hole sleeve and gear reduction drive axle		8mm shaft and 0.25 inch hex fitting Total = 2	Steel	Hex hole sleeve is a manufactured unit with set screws added Manufactured 8mm shaft is customized and milled to hex.
	f5	Stepper Motor		Model: Vexta C014S-9212K 2-Phase Total = 2	N/A	Manufactured 1.4 AMP 5VDC 1.8 Degrees per Step Precision Worm Gear Reducer Stepper Motor
	f6	Motor mount and spool support bearings		Total = 2	Aluminum, bearings	Custom plate aluminum mounting bracket 8mm bearings with custom mount
	f7	Spooler frame		50 3/7 inch x 11 inch Total = 2	Aluminum Extrusions, steel eye bolts	Custom made 4 eye hooks

	f8	LED lights (warm and cool white)		LED tape: 50 inch each with RF dimmer Total = 4	Light	Manufactured 12V LED tape lights dimmer switch remote
Tyvek	f9	Parachute cord		size : variable Total = 1	Nylon	Manufactured
	f10	Tyvek		45 inch x 150 feet Total = 5	Black Tyvek	website
	f11	Seam stick basting tape		3/8 inch width Total = 1	tape	Used to fuse together two tyvek rolls
Punching System	f12	Linear guides - medium load		Manufacture: 15mm x 1240mm Mounting height: 24mm Customized size: 28mm x 48" Total = 2	N/A	Misumi USA Standard Linear Guides website
	f13	Limit switch		MPN: CN 0142 Total = 2	N/A	Limit Switch Roller Arm 5A (125VAC), 3A (250 VAC) With customized mount
	f14	Puncher with customized awl		Solenoid - 36v -> 1.85A 12v -> 650mA Total = 2	Solenoid, aluminum awl	A custom built awl is threaded onto the solenoid piston for punching
	f15	Puncher mount		Top: 2 x 2 inch Side : 2 x 2.4 inch Total = 2	Aluminum	Customized brackets for attaching the solenoid to the linear rail block Top -> linear block Side -> solenoid
	f16	Aluminum GT2 Pulley		Teeth: 24, Bore: 5 mm, Flange: Dual, Pitch: 2 mm, Trade Name: GT2, Belt Width: 6 mm	Aluminum	Customized brackets for the pulley website

				Total = 4		
	f17	Stepper motor		Total = 2	unknown	Anaheim Automation 17Y website
	f18	GT2 Belting - Open Ended		Width: 6mm, Pitch: 2mm, Length: 1 ft, Trade Belt length 8 feet each Total = 2	Neoprene	website
	f19	Linear rail support		49 1/2 x 1 3/8 x 1 1/2 inches Total = 2	Birch plywood	
	f20	Power transfer system		Customized Brush and steel rod Total = 2	Steel, copper coil	Provided electrical connection between the power supply and the solenoid
	f21	Belt clamp		Customized clamp Total = 2	Aluminum	
	f22	Mount Plate		1 1/2 x 8 x 1/8 inch Total = 4	Aluminum	Attached the linear rail to the machine body
Parts for Water pool	f23	Pond liner		Customized size 48 x 77 x 7 inch Total = 2	Polypro Liner (Regular Strength)	Rectangular Box Welded Pond Liner Insert

	f24	Mounts		<p>Top side: 3 7/8 inch Right side: 6 1/2 inch Bottom side: 1 1/4 inch</p> <p>Diameter of each three holes in the top : 0.125 inch</p> <p>Diameter of bottom 0.25 inch</p> <p>Total = 4</p>	Aluminum	Custom made
	f25	Poles		<p>Paper hold rings: 5/8 inch depth 1.5 inch diameter</p> <p>Inner diameter: 1 inch</p> <p>Length of pole: 47 3/8 inch</p> <p>Total = 4</p>	Aluminum	Custom made
Circuit	f26	Arduino Uno		<p>Length 68.6 mm Width 53.4 mm</p> <p>Total = 2</p>	N/A	
Circuit	f27	Raspberry Pi		<p>5 x 4 x 3 inches</p> <p>Total = 4</p>	N/A	
	f28	Raspberry Pi cases		<p>3.74 x 2.44 x 1.06 inches</p> <p>Total = 4</p>	plastic	
	f29	Motor drives		<p>Geckodrive Motor control</p> <p>2.5 x 2.5 x 0.8375 inches</p> <p>Total = 4</p>	N/A	Website
	f30	Relay		<p>OMR-C-105H</p>	N/A	

	f31	Diodes		diode: 1N4001	N/A	
	f32	Power		12V - solenoid 24V - Stepper motors	N/A	Stepper Motor powers (Spooler) powers (Puncher) Led light powers
Wall	f33	Wallpapers		27 inch x 4 feet on tyvek	Paper, tyvek, stucco, molding paste, paint	
Projectors	f34	HD Projectors		BenQ W1070 1080p 3D DLP	N/A	
	f35	Pocket projectors		AAXA P300 Pico/Micro LED Projector, WXGA 1280x800 Resolution	N/A	
	f36	Projector mounts		Cheetah Mounts APMEB Universal Projector Ceiling Mount	N/A	
	f37	Cables		HDMI cables	N/A	
Computer	f38			Mac Mini	N/A	The main cpu for controlling videos, motors and sound
Speakers	f39	Loud speakers		Genelec loud speakers	N/A	
	f40	Audio interface		Motu Ultralite	N/A	

- **System Design**

The main control system for *Two Women* was adapted and extended from a previous project, *Vestiges, part II* (see fig.3.29), which controlled several computers coordinating multiple channels of audio and video, and processed sensor input to generate algorithmic video.



Figure 3.30: Ha Na Lee, *Vestiges, part II*, installation documentation (2013)

The system can scale to an arbitrarily large number of audio and video playback nodes by the addition of more computers to the network. All of the elements of the system talk to each other through Open Sound Control (OSC) messages over a TCP/IP network.

The *Two Women* system is composed of a handful of special purpose programs which are orchestrated together by SuperCollider. Figure 3.30 shows the flow of data through the system. Each of the blue colored boxes in the system represent discrete programs which run autonomously, waiting for data or commands from SuperCollider to perform tasks.

The boxes labeled *Spool Gcode to Arduinos* and *arduino Grbl* represent the puncher/spooler subsystem. The Arduinos run a stock version of Grbl⁴⁰, which is an open source CNC controller. The functions of a CNC controller are mapped onto the installation rather straightforwardly. The linear rail is represented by the X-axis of control, while the spooling mechanism is controlled by the Y-axis of control. The puncher is represented by the coolant

⁴⁰Grbl, <https://github.com/grbl/grbl>

on/off control. Grbl is controlled by Gcode, a numerical control programming language which is widely used for computer based manufacturing machine tools.

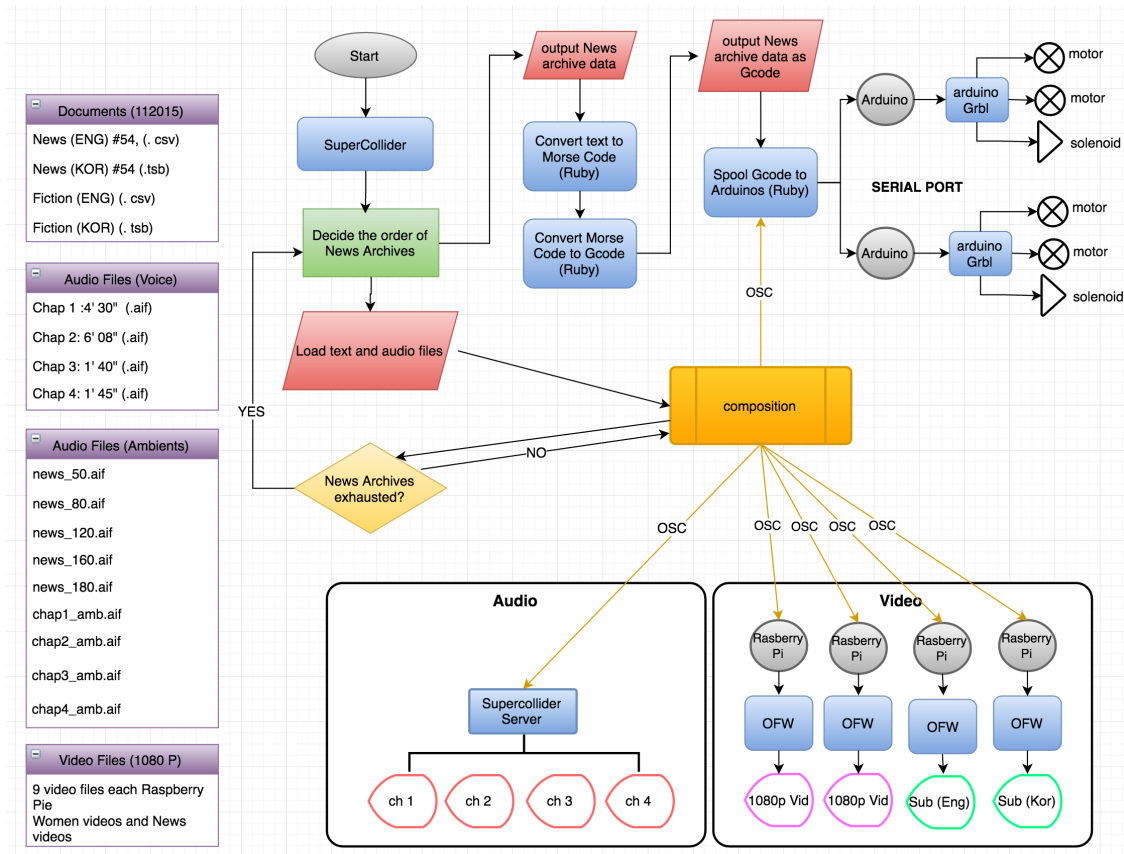


Figure 3.31: The system flowchart

Spool Gcode to Arduinos is a small Ruby program which handles parsing and converting the news files into Gcode and feeding the Gcode to the Arduinos over a serial port. The screenshot of a portion of the Ruby code below (see fig.3.31) demonstrates the functions of calculating distances of x and y movements as well as generating Gcode commands.

```
# defaults
@x_feed_rate = 5000
@y_feed_rate = 500
@x_pos = 0

$\ = '\n'
@sp = SerialPort.new(serial_port, BAUD_RATE, DATA_BITS, STOP_BITS, PARITY)
at_exit { @sp.close }

while (i = @sp.gets) do
  logger.info i.chomp!
  if i =~ /unlock/
    logger.info "ready"
    break
  end
end
end
```

```

    home
    self
end

def dot
  move_x(x_pos + dot_spacing)
  punch(punch_pre_pause, punch_mid_pause, punch_post_pause)
end

def dash
  move_x(x_pos + dot_spacing)
  punch(punch_pre_pause, punch_mid_pause, punch_post_pause)
  2.times do
    move_x(x_pos + dash_spacing)
    punch(punch_pre_pause, punch_mid_pause, punch_post_pause)
  end
end

def home
  @x_pos = 0
  stream("$H")
end

def move_x(pos, feed_rate=x_feed_rate)
  if pos >= MAX_WIDTH
    next_line
    return
  end

  @x_pos = pos
  stream("G90")
  stream("F#{ feed_rate }")
  stream("G1")
  stream("X#{ x_pos }")
end

def move_y(pos, feed_rate=y_feed_rate)
  stream("G91")
  stream("F#{ feed_rate }")
  stream("G1")
  stream("Y#{ pos }")
end

```

Figure 3.32: Screenshot of Ruby code

In order to maintain some real-time control over the punching system, the Ruby program has an OSC interface which listens for ‘start’, ‘stop’, ‘auto’, ‘manual’, and ‘tick’ messages. Start and stop turn the system on or off. Auto and manual put the system into different modes. In manual mode, the system will queue up a command but won’t execute it until a tick message arrives. This allows SuperCollider to control the timing of punches and moves. In auto mode, the punching machine handles its own timing and rhythm and needs no input or control from SuperCollider to run. The Ruby program adds some randomness to the timing of moves and punches in auto mode to help give the system the perception of some agency, and a more organic feel.

The punching subsystem consumes news articles which are pre-processed into symbolic Morse code made up of periods (representing dot), dashes, and spaces. A script handles mapping strings from the database of news articles into this symbolic form. The intermediate form is useful for debugging, because it's easy to visually compare with the punched paper output to see if it is correct.

```

MORSE_MAPPING = {
12593 => '...', # 'ㄱ' 48 => '---' # '0'
12594 => '...', # 'ㅋ' 49 => '---' # '1'
12595 => '...', # 'ㆁ' 50 => '---' # '2'
12596 => '...', # 'ㄴ' 51 => '---' # '3'
12597 => '...', # 'ㄷ' 52 => '---' # '4'
12598 => '...', # 'ㄹ' 53 => '---' # '5'
12599 => '...', # 'ㄷ' 54 => '---' # '6'
12600 => '...', # 'ㄷ' 55 => '---' # '7'
12601 => '...', # 'ㄷ' 56 => '---' # '8'
12602 => '...', # 'ㄷ' 57 => '---' # '9'
12603 => '...', # 'ㅁ' 97 => '---' # 'a'
12604 => '...', # 'ㅂ' 98 => '---' # 'b'
12605 => '...', # 'ㅅ' 99 => '---' # 'c'
12606 => '...', # 'ㅇ' 100 => '---' # 'd'
12607 => '...', # 'ㅈ' 101 => '---' # 'e'
12608 => '...', # 'ㅊ' 102 => '---' # 'f'
12609 => '...', # 'ㅋ' 103 => '---' # 'g'
12610 => '...', # 'ㅌ' 104 => '---' # 'h'
12611 => '...', # 'ㅍ' 105 => '---' # 'i'
12612 => '...', # 'ㅍ' 106 => '---' # 'j'
12613 => '...', # 'ㅍ' 107 => '---' # 'k'
12614 => '...', # 'ㅍ' 108 => '---' # 'l'
12615 => '...', # 'ㅍ' 109 => '---' # 'm'
12616 => '...', # 'ㅍ' 110 => '---' # 'n'
12617 => '...', # 'ㅍ' 111 => '---' # 'o'
12618 => '...', # 'ㅍ' 112 => '---' # 'p'
12619 => '...', # 'ㅍ' 113 => '---' # 'q'
12620 => '...', # 'ㅍ' 114 => '---' # 'r'
12621 => '...', # 'ㅍ' 115 => '---' # 's'
12622 => '...', # 'ㅍ' 116 => '---' # 't'
12623 => '...', # 'ㅍ' 117 => '---' # 'u'
12624 => '...', # 'ㅍ' 118 => '---' # 'v'
12625 => '...', # 'ㅍ' 119 => '---' # 'w'
12626 => '...', # 'ㅍ' 120 => '---' # 'x'
12627 => '...', # 'ㅍ' 121 => '---' # 'y'
12628 => '...', # 'ㅍ' 122 => '---' # 'z'
12629 => '...', # 'ㅍ' 32 => '---' # '1'
12630 => '...', # 'ㅍ' 46 => '---' # '2'
12631 => '...', # 'ㅍ' 44 => '---' # '3'
12632 => '...', # 'ㅍ' 63 => '---' # '4'
12633 => '...', # 'ㅍ' 33 => '---' # '5'
12634 => '...', # 'ㅍ' 47 => '---' # '6'
12635 => '...', # 'ㅍ' 39 => '---' # '7'
12636 => '...', # 'ㅍ' 40 => '---' # '8'
12637 => '...', # 'ㅍ' 41 => '---' # '9'
12638 => '...', # 'ㅍ' 34 => '---' # 'a'
12639 => '...', # 'ㅍ' 38 => '---' # 'b'
# 'ㅍ' 58 => '---' # 'c'
# 'ㅍ' 59 => '---' # 'd'
# 'ㅍ' 61 => '---' # 'e'
# 'ㅍ' 43 => '---' # 'f'
# 'ㅍ' 45 => '---' # 'g'
# 'ㅍ' 95 => '---' # 'h'
# 'ㅍ' 36 => '---' # 'i'
# 'ㅍ' 64 => '---' # 'j'
}

```

Figure 3.33: Left - Mappings from Korean & English to Morse code
 Right - Output text file of Morse translated from Korean characters

The video subsystems are split into two separate programs. One program renders subtitles, which are sent over OSC. It handles formatting, spacing, and has some animation capabilities for displaying and wiping the text line by line. The system has no other notion of duration and is completely dependent on OSC messages to sequence and time subtitles display. The other video subsystem only plays videos. Since the videos are large, they are stored locally on each playback machine. OSC messages control which video is being played.

SuperCollider⁴¹ handles the audio subsystem and serves as the main composition tool for coordinating the disparate parts of the installation. SuperCollider is a really effective language to compose with time and schedule events.

The composition system determines the content and duration of all of the other subsystems. It sends subtitles for display, controls video selection and playback, as well as audio synthesis and playback. When one cycle of the whole installation playback is done, the system re-scrambles and re-orders the news archives (see fig.3.33) and begins again.

```
if(i == numArchivNews, {
  indexArray = arrayNum.scramble;
  indexArray.postln;
  i = 0;
  indexArray.size.do({arg i;
    ~time.put(i, ~k_news_dur.at(indexArray[i]));
  });
  ("index: "+ indexArray+":" + ~time).postln;
});
```

Figure 3.34: Screenshot of SuperCollider code

At least four different programming languages were used to implement *Two Women*. Each language has distinct advantages which make it well suited to a particular task. SuperCollider is really great at composing in time domain, handling real-time events, audio, and controlling other systems via OSC. Ruby is superior at text processing, and can be rapidly iterated on because it is a scripting language. C++, while difficult to use, is a high performance language so it was used for speed-sensitive critical code, such as a video playback. All the source code for the project is open to the public and available for download (see APPENDIX A, page 94).

⁴¹SuperCollider is a programming language for real time audio synthesis and algorithmic composition. For more information, visit <http://supercollider.github.io/>

- **Narrative / Composition**

Two Women oscillates back and forth between two modes of storytelling. The first mode is that of the old woman. The narrative of the old woman is written in a style of open poetic language and it proceeds linearly within a chapter. The temporal relations between each chapter are not clearly linked but rather remain ambiguous. The chapters are called in a numeric sequence, but they are not necessarily experienced linearly. In other words, the audience doesn't have to hear any previous chapter to fully understand the current chapter.

Each chapter has a theme. For example, chapter 1 is about herself and she talks about her room in descriptive language. Chapter 2 describes her surreal dream and her reactions to confronting two punching machines. Chapter 3 and 4 reveal the moment of meeting her younger self. Then she sees her younger self drowning and she feels both fearful and comforted. The total duration of all the chapters in this mode is about 14 minutes. The chapters were written in Korean, and translated into English.

The chapters are held in a CSV (Comma-separated values) format, which is annotated with the start and the end times necessary to drive the subtitles subsystem (All chapters are available in APPENDIX B, page 95).

The second mode is based on a database of news archives culled from various Korean newspapers between 1920s and 1990s. The news articles were specifically picked to echo the demographic of the main character: a minority, a female, a senior and etc. The individual characters of the selected news article are automatically counted in order to dynamically determine the display duration, which provides enough time for the reader to get through the whole article. Figure 3.34 presents an example of a function that parses a string and counts characters. The result of the final sum is clamped to between 50 and 160 seconds to avoid having a story which is displayed for too short, or too long. This process also involves selecting a sound file and trigger the video player to playback appropriate footage for this mode.

```

Task({
    ~kor_sub_net.sendMessage("/set_dur", newsWait.sum + ~newsDur, mode); //osc msg date
    ~eng_sub_net.sendMessage("/set_dur", newsWait.sum+ ~newsDur, mode); //osc msg date
    0.1.wait;
    newsSound_func.value(~newsDur);

    0.1.wait;
    ~date_kor.postln;
    ~kor_sub_net.sendMessage("/news", ~date_kor); //osc msg date
    newsWait[0].wait;

    ~title_kor.postln;
    ~kor_sub_net.sendMessage("/news", ~title_kor); //osc msg title
    newsWait[1].wait;

    ~story_kor.split($ ).do({ arg it, i;
        var lineNum;
        lineNum = 0;
        counter = counter+ it.size;
        //counter.postln;
        //(it + it.size).postln;
        if (phrase_k == "", { phrase_k = it;}, {phrase_k = phrase_k ++ " " ++ it;});
        if (counter > kor_maxWord, {
            lineNum = lineNum+i;
            //phrase_k.postln;
            ~kor_sub_net.sendMessage("/news", phrase_k); //osc msg title
            newsWait[2].wait;
            phrase_k = "";
            ~newsWait_mul = newsWait[2] * lineNum;
            counter = 0;
        });
    });

    if(counter < kor_maxWord && counter > 0, {
        //phrase_k.postln;
        ~kor_sub_net.sendMessage("/news", phrase_k); //osc msg title
        ~newsWait_mul = newsWait_mul + 5.0;
        phrase_k = "";
        counter = 0;
    });
    newsWait[3].wait;

    /**ending media news print
    //~media_kor.postln;
    ~kor_sub_net.sendMessage("/news", ~media_kor); //osc msg title
    "end of news in kor".postln;
}).start;

```

Figure 3.35: Screenshot of calculating duration of news archive in SuperCollider

The total duration of each iteration of the entire piece is variable due to the news durations, though it typically falls in a range between 18 and 24 minutes. The flexibility of playback duration was created to support the addition of real-time news feeds, though that feature was cut due to the spiralling complexity of the work.

The interplay between the news archive mode and the fictional story (see fig. 3.35) echoes a cinematic technique called ‘intercut.’ Intercut is a technique to alternate two scenes, or shots, back and forth to make one composite scene, which occurs at the same time. The consequence of intercut is to unite two different temporal and spatial elements together into one scene. The narrative of history resides in her room while her own story unfolds in the present.

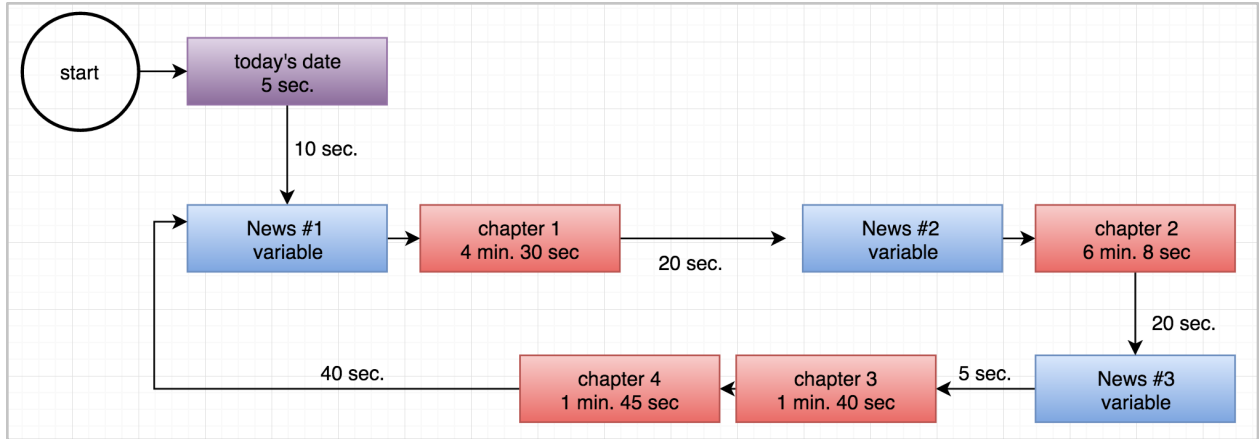


Figure 3.36: Composition diagram with duration and intervals

Each segment of the composition is timestamped with a date and year. The chapters about the old woman show the passage of time on the day of March 8th in 2006, the day she died. The text associated with the old woman is displayed in a format similar to subtitles for movies. The text is broken up into segments of approximately 32 characters (or less) and synced up to the audio track.

To visually discriminate between the story and the news archives, the news archives are displayed all at once with a date, title, body, and source (see Table.3.2). The text lines appear sequentially and vanish in the same order they appeared.

Table 3.2: Text format of news archive

Date /Year
Headline title
Story
Journal name

- **Video / Sound Compositions**

Video

Two Women uses four different types of videos: abstract, wallpaper, woman in a traditional dress, and a woman in a contemporary dress. For the abstract video, the idea is to mimic fabric floating over the water which dissolves into particles which move around like water. The abstract videos are generated with a plug-in called “Trapcode” in AfterEffects. The plug-in takes an obj file, a simple data-format which represents 3D geometry, and generates particles based on the form. A previous project entitled *Madhye* (2013)(see fig.3.36) used this method. The single channel video is entirely constructed of still images and the particle system.



Figure 3.37: Ha Na Lee, *Madhye* (2013) collaboration with Shih-wei Lo, composer, video still

Instead of a model of a dress, a synthetic model of generated peaks of a mountain is used. This substitution brings the right level of dynamic surface, pattern, and range of brightness (see.fig.3.37), while still evoking the image of fabric floating in the water. The mountain is represented by 600 points in 3-dimensional space (see.fig.3.38). A virtual camera was employed to abstract the object. By bringing the camera very close to the object, the image composition is cropped and creates a dynamic depth of field.

The plug-in includes a four-dimensional Perlin noise generator which displaces the particles over time. This gives an effect of flowing, organic, fire-like motion. Over time, the particles are rotated about x, y, z axes, dispersed and twisted in space as well (see fig 3.38).

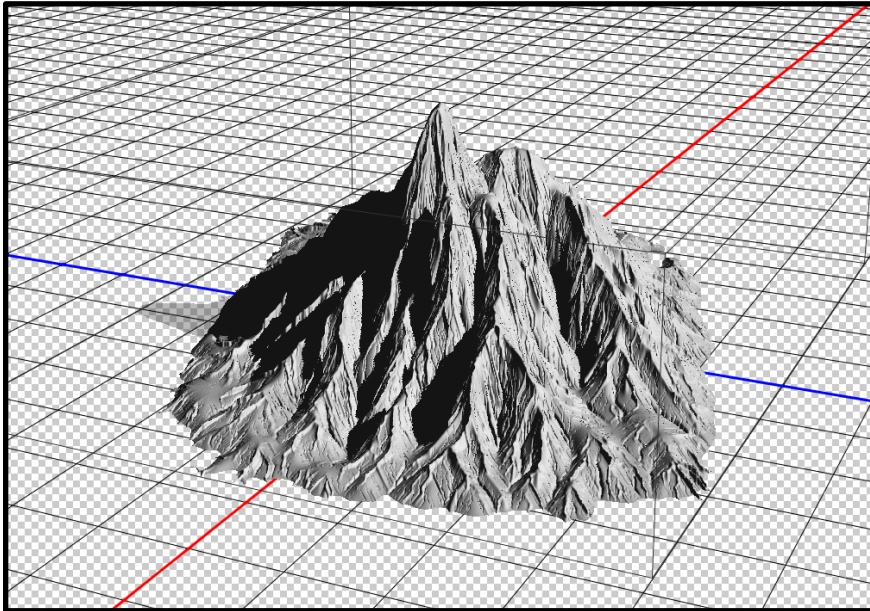


Figure 3.38: The view of 3-D Mountain peaks in obj file

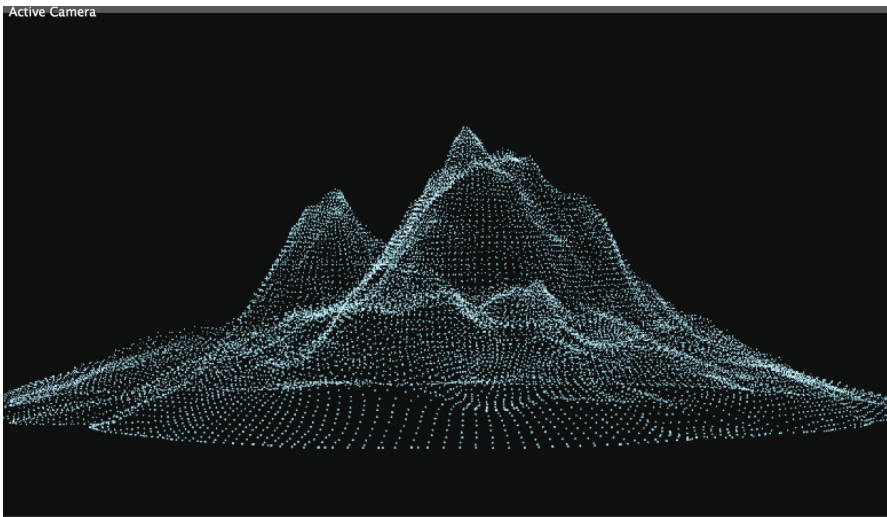


Figure 3.39: Screenshot of particle representation in the shape of mountain

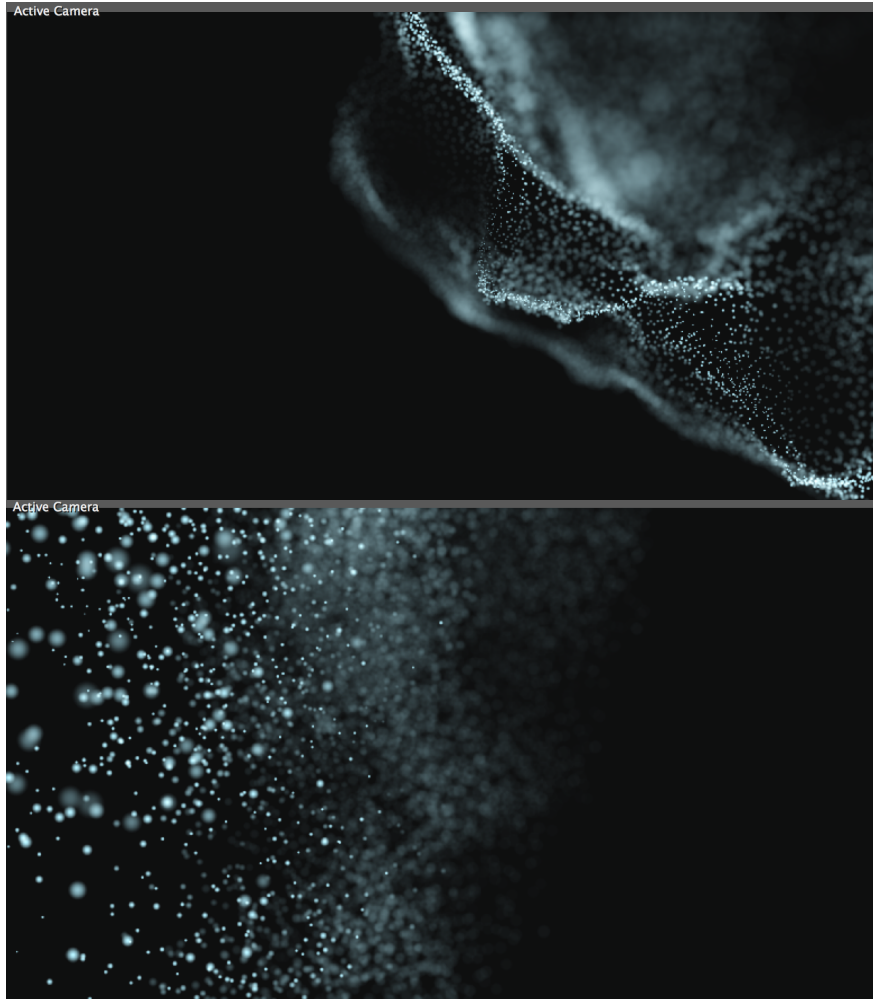


Figure 3.40: Screenshots of zoomed and rotated particles

For the entire duration of Chapter 1 (4 minutes and 30 seconds), both machines show wallpaper images. The video is constructed upon one still image. The process of creating the wallpaper image was to take a snapshot of the actual wallpaper in the installation and composite a small window into the scene. The image of the wallpaper works well because the story describes things the narrator owned inside of the room. The room is surrounded by distressed dark wallpaper. Projecting the wallpaper into the surface of water is like a reflection. And ultimately, the pool of water is like a mirror.

The wallpaper projection slowly fades in over the duration of 2 minutes. This extremely slow fade-in is designed to focus the audience's attention on the female voiceover. The agonizingly slow appearance of the image draws the viewer in because it's impossible to resolve the image until it's almost done with its fade-in. To intensify the experience, projected virtual

water droplets drip into the pool, creating a moment of ambiguity in which the audience can't distinguish the real from the virtual. This effect adds another dimension to the image.

The film *La Jetée* (1962) by Chris Marker uses this technique of compositing a still image and a moving image effectively and brilliantly. The technique is even conceptually tied to the story. The entire film is constructed as a series of still images. A few seconds of a moving image appears when the woman, who the main character loves in his memory, blinks her eyes. Here, a still image and a moving image implies the passage of time. In *Two Women* the encounter of the water ripples brings the audience's attention back to stillness which came before.



Figure 3.41: Still images of Chapter 1 video; wallpaper and wallpaper after water ripple

The Chapter 2 video interacts with the voiceover narration. In the story, the narrator is in her room where she can hear the sounds of machines. She sees two machines occupying the front of her room. She is terrified yet curious to explore what the machines do. She doesn't know exactly what is happening, and describes the look of the machines. While exploring, she finds a coffin-like bed of water in which her younger self lays submerged.

The women (see fig.3.41) in each pool represent polar opposite dualities of traditional/contemporary, light/dark, and resigned/resistant-fearful. The woman in the contemporary dress on the right machine constantly pulls her body into a fetal position, whereas the woman in the white traditional dress looks comfortable and calm.

In the story, when the old woman discovers the women on the bed, the woman in the white dress cuts into a medium size shot. She opens her eyes and reaches out her arm while mumbling (see fig 3.42). This is the only point where this chapter of the video responds to the audio and engages with viewers directly.



Figure 3.42: Still images of Chapter 2 video



Figure 3.43: Chapter 2 video with reaction

All of the video in Chapter 2 was shot from a point of view looking downward. This downward view mimics the audience's point of view and supports the illusion of a woman submerged in the pool.

Chapter 3 has similar gestures as Chapter 2, but focuses more on the feeling of fear of the woman dressed in black. She has a series of gestures to shrink, cover her face, and go down deeper in the water while the woman in the white dress looks a bit pained, but calm.

Chapter 4 videos show moments of falling deep into the water and a momentary shot inverting the plane of view where the light outside can be seen from a point of view shot beneath the water.

Due to the physical limitations of pressure, buoyancy, and the pool's depth, it was challenging to create the sequence of the women sinking deep into the water. The movement of falling was difficult for the actor due to water pressure, so computer animation was applied to intensify the gesture.

Many speed adjustments had to be made. Since the actor could only hold her breath for 3 to 5 minutes, each shot was very short. Some shots were stitched together from multiple takes. Some of the shots are slowed by 50%. Although this could have had a detrimental effect on the overall quality, the underwater projection and Tyvek screen material hide some of the weaknesses of the footage. The slow playback also creates a somewhat ethereal dreamy quality.



Figure 3.44: Still images of Chapter 3 video

Sound

In *Two Women*, there are several layers of sound elements: ambient sound for news, the female voiceover, and the mechanical sounds of the punching machines. As previously mentioned, the composition of ambient sound is influenced by the sound of paper. Using the ambisonic microphone technique, multiple files of paper flapping and crumbling sounds were recorded. Using the Ambisonic Tool Kit (ATK) in SuperCollider, the sounds were spatialized, composed, and processed.

Most of the sound instruments in the SuperCollider composition were adopted from my previous project *Shadow of Sounds* (2011-2012), an interactive real-time sound processing &

kinetic light installation. *Shadow of Sounds* creates and explores resonances between present and past time by means of sonic and tactile experience. The sound of footsteps on rock salt is captured in real-time, processed algorithmically, and played back into the space. Some of the sounds are real-time, while others are time-shifted memories of previous visitors in the space. Motor-actuated lights are triggered by the audience's interaction with the salt under their foot. The swinging lights create an interplay of shadows on the surrounding environment. In these surroundings participants create their own cinematic experience, narrative, and aesthetic community.



Figure 3.45: Ha Na Lee, *Shadow of Sounds* (2011-2012), installation documentation

Based on the experimentations of making *Shadow of Sounds*, the machine sounds were recorded with a contact microphone, and mixed with the back track of the ambient sound. Multiple layered sounds are created and spatialized to support the main voice overs. The major recordings are from the paper flipping, crumbling, waving sounds in space. Also, a large room tone with reverberation and amplified water drips sounds are used to generate a fantasy space. Some of the audio instruments and signal processing techniques use Ringz filters, Granular synthesis, and Tendency masks (stored data for creating random values over time).

The processed audio files were rendered individually and layered together in “Reaper,” which is a digital audio workstation. The ambient audio clips were rendered by compositing

various different audio textures as well as field recordings. Although the audio system is capable of real-time processing, these pre-rendered files were used to simplify the installation environment and ensure robust performance for the duration of the exhibition.

Aside from recorded and processed punching sounds, the sounds of the real punching machines had to be considered in the installation. Many experiments were conducted testing different types of equipment for punching. The voltage applied to the solenoids went through several revisions as we tried making the puncher louder and then eventually decided softer was better. The voltage applied to the stepper motors also had to be tweaked to tweak volume of the punching head as it moved back and forth.

For the most part the punching sounds are fairly monotonous. In order to give the punching machine some gesture, music analysis techniques are employed in Chapter 2 to synchronize the puncher with the spoken word of the narrator. An onset detector is applied in real-time to the audio to detect the beginning of a sound and output a control-rate trigger signal. In practice, this causes the punching machine to fire an event at the beginning of a word or sequence of words. Events may be a punch, release, or movement of the punching head. Based on the Chapter 2 narration, the punching mechanism fires an event 2 or 3 times on each sentence. This technique creates a sense of urgency, and a dynamic which make the scene stand out. Figure 3.46 demonstrates an example of the onset detection code.

```
o = OSCFunc({ arg msg;
  var val;
  if((msg[1] == 1000), {
    "punching".postln;

    SynthDef(\ticks, { arg outBus = 0, amp = 0.5;
      var pips, freq;
      freq = MouseX.kr(0,1);
      pips = WhiteNoise.ar(EnvGen.kr(Env.perc(0.001, 0.1, 0.2), freq));
      Out.ar(outBus, Pan2.ar(pips, 0.75, 1));
      //Out.ar(0, [ sig, out ]*env);
    }).play(s);

  });
}, '/the_answer');

SynthDef(\playbuf, { arg buf, fft, amp=0.75, threshes = 0.5, mingap = 10;
  var sig, env, chain, out, onsets, pips, values, freq, frequency;
  //env = Ramp.kr(amp, 2.0);
  frequency = 0.1;
  env = Lag.kr(amp, 3.0);
  sig = PlayBuf.ar(1, buf, BufRateScale.kr(buf), 1, 0, 0, 2);
  chain = FFT(fft, sig);
  //kr (chain, threshold: 0.5, odftype: 'rcomplex', relaxtime: 1, floor: 0.1, mingap: 10, medianspan: 11, whtype: 1, rawodf: 0)
  //mingap to arrange the time of punching
  //onsets = Onsets.kr(chain, threshes, \wphase, 1, 0.1, mingap, 11, 1, 0 );
  onsets = Onsets.kr(chain, threshes, \rcomplex, 1, 0.5, mingap, 11, 1, 0 );
  SendReply.kr(onsets, '/the_answer', values, -1);
  PV_Diffuser(chain);
  out = IFFT(chain);
  // You'll hear percussive "ticks" whenever an onset is detected
  //pips = WhiteNoise.ar(EnvGen.kr(Env.perc(0.001, 0.1, 0.2), onsets));
  Out.ar(0, Pan2.ar(out, -0.75, 0.2));
}).load(s);
```

Figure 3.46: Screenshot of an example code of Onsets detection

In cinema, voice narration evokes intimacy yet at the same time a strange flowing energy. The voice is very hard to pin down and tie to its emitter. As Michel Chion notes,

The voice is elusive. Once you've eliminated everything that is not the voice itself-the body that houses it, the words it carries, the notes it sings, the traits by which it defines a speaking person, and the timbres that color it, what's left? What a strange object, what grist for poetic outpourings...⁴²

In the book *The Voice in Cinema*, Chion focuses on the uncanny phenomena of the voice in cinema. He describes the voice as a being that hovers over images inside and outside, and seeks a place to settle. Chion defines *acousmêtre* as the presence of a voice which has yet to be connected to a face. The disembodied voice is omnipresent. Therefore it has no clearly defined limits to its power.⁴³ For example, the Hal character in *2001: A Space Odyssey* (1968) by Stanley Kubrick, Alpha 60 in *Alphaville* (1965) by Jean-Luc Godard, and The Wizard of Oz in the *The Wizard of Oz* (1939).

Looking inside the history of cinema, Chion pointed out how the audiences are trained to connect images and sound even though the gap in between the two is as big as ever. The gap between sound and image is still an interesting subject in media culture. One of the unique characteristics of an *Acousmêtre* is the disjunction between sound and image. By supplying the voice, the image is occupied, but the true source of the voice's identity is withheld. The gap between the disembodied voice and video images in *Two Women* is very large. The audience needs to use their own imagination to bridge the gap and experience the voice.

⁴²Michel Chion, *The Voice in Cinema*, ed. and trans. Caludia Gorbman, (Columbia University Press 1999), 1

⁴³Michel Chion. *Audio-vision: Sound on Screen*, ed. and trans. Caludia Gorbman, (Columbia University Press 1994), Foreword XXIII.

3.7 Feedback / Reflection

This section will mainly discuss feedback from the opening show at *Currents: The Santa Fe International New Media Art Festival*, Santa Fe, in 2015. The opening night was really packed and over 7000 visitors came to the show. Audience members were curious about the machines and projections, and gave us many compliments. A minority of the audience, confronted with the disturbing news stories and the description of the project, expressed horror or disgust and left immediately. On the other hand, many viewers stayed around reading the news archives and experiencing the piece through multiple iterations. Several viewers confessed to their own losses to suicide, though almost all were reluctant to admit it until they had a lengthy conversation with us.

Some technical suggestions and improvements were suggested. The punching mechanism is very hard to see in the low light. Though the subtitle projection spills over some light, it would be better to install some directed light to show the lines of the punched Morse code. Painting the machine bodies was recommended. The unpainted wood was too light in color compared to the rest of the installation, and the color of the wooden platforms needed to be toned down. The English side of the platform got too crowded since it was the only mean for viewers to understand the narrator and the news archives. The placement of the subtitles may need to be reconsidered. The use of an English voice over may also be considered.



Figure 3.47: Photo documentation of the exhibition at *Currents: The Santa Fe International New Media Art Festival*, Santa Fe, NM on June 10, 2015.

Lastly, feedback from colleagues and faculty raised concerns about the use of the space. All elements of the piece could be dispersed spatially. The density of the project is too difficult to comprehend at once. Also, the spent rolls of punched paper need to be displayed in the space in order to complete the artwork.

Chapter 4. FUTURE DIRECTION / CONCLUSION

Two Women has room for improvement, especially in terms of technical, architectural, and system design problems. This section will focus on examining those issues, and discussing possible remedies. The section will conclude with a discussion of future research directions.

4.1 Future Technical/ Design considerations

For the exhibition at *Currents: The Santa Fe International New Media Art Festival*, the design of the tabulating table with water pool had to change from a metal structure to a wood box for portability and budget reasons. The tight fabrication schedule left no spare time to experiment with different materials and a new design. The design of the machine bodies should be significantly different. Instead of using only wood, the machine bodies should have metal pools for the water. The intention would be for the machine body to look like a table instead of a box (see. Fig 3.10). The original inspiration for the table was a Jacquard loom, and having that level of craft and detail would add a significant level of richness to the set. The tabulating table would be easy to assemble, disassemble, and transport.

The spooling mechanism had some engineering problems. The tension on the Tyvek paper was significant enough to cause the spool rod to bow slightly. This slight bowing would cause the paper to creep toward the center of the rod over the course of a few days, resulting in bunching and folding of the paper. The rod needs to be reinforced, and an alternate method for attaching the paper to the rod devised. Feeding the paper through the slot in the rod is a fussy affair and not suitable for a long term installation where the paper may need to be changed several times.

During the installation setup there were several significant issues. Two days before the opening exhibition, the punching system became unreliable and would “crash” after running for about 20 minutes. The problem was remedied by powering the solenoid and stepper motors from different power supplies. This ad-hoc emergency solution was implemented with jumper wires and breadboards, and needs to be solidified with a more permanent and robust perf-board based solution.

One of the main projectors kept overheating after running for about 30 minutes. We were advised that projectors should not be installed with the lens position pointing down. In future

installations the projectors will be mounted per the manufacturer's specifications, and first-surface mirrors will be used to redirect the projection downward.

The database of news archives will continuously grow, though conceptually it would be desirable to incorporate real-time data into the piece. The co-existence between the past, and the present through artwork is one of the main concept, yet, this element of time is still incomplete. An early prototype of *Two Women* used APIs to search the popular Korean search site Naver to pull in real-time data. The search term used was the Korean word 자살 (suicide). The lack of a robust filtering process caused the feed to be polluted with a lot of garbage. A much more sophisticated algorithm needs to be developed if the system is to run fully autonomously.

Exhibiting the spent rolls of punched paper in the space will be a way of presenting the past in a graphic and tactile way. This element was always intended to be a part of the installation, but due to time constraints it was not possible to pre-punch enough rolls for the exhibit. In the future, the system can be run at a high speed for a few days to produce enough spent rolls to include in the installation.

The footprint of the installation needs to be expanded. The original configuration looked good on paper, and the Santa Fe exhibition needed this information for advance planning such as purchasing materials for wall construction, floor covering, and laying out the entire exhibition. Once both machine bodies were fabricated and placed in a mock-up space, it was clear the installation felt a little claustrophobic but workable. The exhibition in Santa Fe was the first chance to seeing how the project worked with a representative audience and it would clearly benefit from almost double the square footage. The piece also clearly needs some reconsideration to help redistribute people away from the English subtitle platform.

The overall setup of the installation could be altered to encourage the audience to move around the space more freely. In the current setup the strong forward-facing, rectilinear setup lends itself well to viewing from mainly one viewpoint (i.e. the front). Adventurous viewers will investigate the space more thoroughly, looking at the back side of the punched paper, touching the paper and the water, but perhaps breaking up the space from one space into multiple spaces would help to create a more inviting and natural flow for others. The top view diagram in figure 4.1 shows a proposed new layout for *Two Women*. Instead of the "L" shape structure in an open floor plan, there are three main spaces to exhibit.

The area “A” (see fig.4.2) is less than 100 square feet and dimly lit. The four walls are covered with dark distressed wallpaper. Rolls of punched papers are hung on the wall. The audience enters and, as their eyes adjust, they scan the room taking in the puzzling artifacts. Visitors enter the installation through this room which has no video or sound elements.

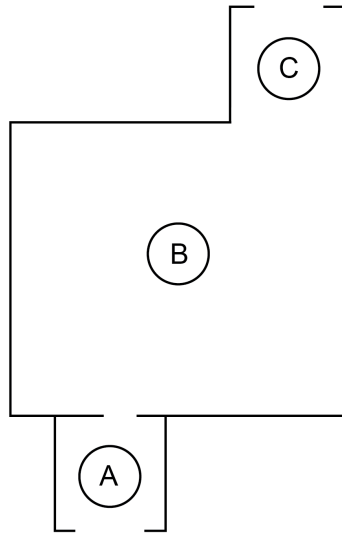


Figure 4.1: *Two Women* architectural space layout

Upon entering area “B” (see fig.4.3) the audience first encounters the two big machines and separate big black pool of water. The punching machines don’t have video subtitles. The spooling and water pool system will be the same. The machines only feature the video of the wall with the small window in it. The pool looks like a minimal sculpture, and is made out of a black lacquer steel. The images of the two women are projected into the pool. The audio portion of the installation is substantially the same as the original.

Three monitors are placed in area “C” (see fig.4.4). The subtitles, news archives, and a new real-time news feed are featured on these screens.



Figure 4.2: Mock-up area A

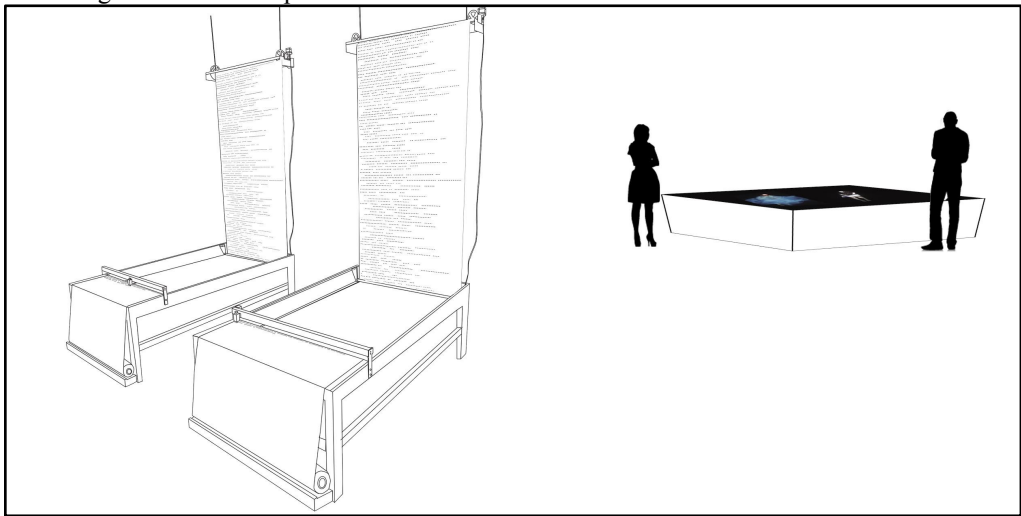


Figure 4.3: Mock-up area B

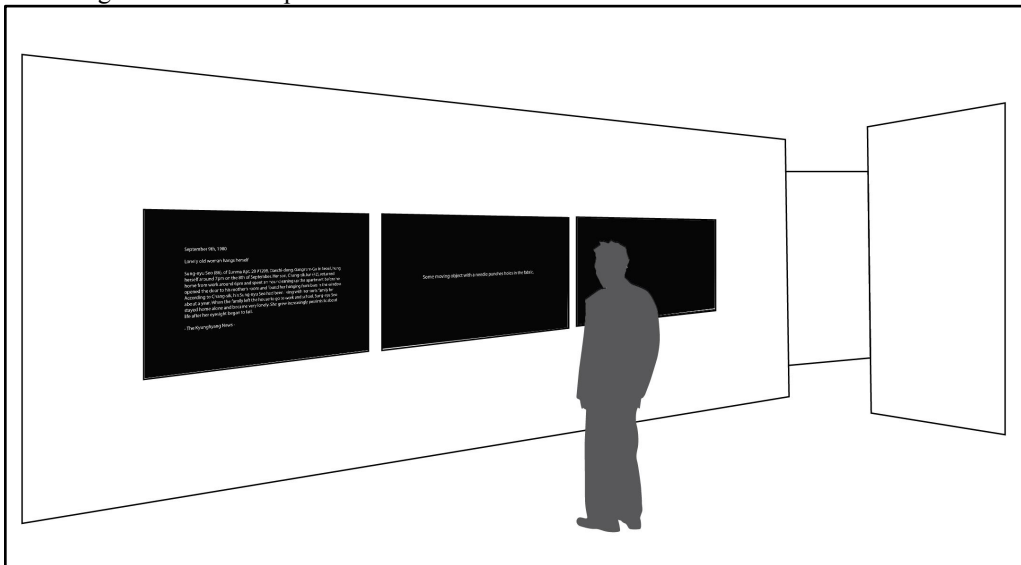


Figure 4.4: Mock-up area C

4.2 Future Research Direction

The issues of architectural space in my artwork has been brought up many times during critiques in the graduate program. Two past projects, *Shadow of Sounds* (2011-2012), and *Vestiges, part II*(2014) attempted to explore poetic narratives in response to their architectural spaces. *Shadow of Sounds* was meant to be installed in an abandoned and decayed building site where theatrical interactions by the audiences would bring the space alive. However, the piece ended up being installed in a gallery space.

Vestiges, part II was installed in a staircase. The piece was designed for the space so that temporal and spatial experiences of going up and down the staircase compressed and delayed by the audience's interaction. The original piece had few chances to be shown to the public, but it got selected to be presented in a festival where the site was more like a gallery space. The staircase was substituted for a long ramp with several turns. The ramp provided some of the same experiences as the staircase, but didn't work as well due to the site-specificity of the video and the way it leveraged known characteristics of the stairwell.

The importance of the space in these pieces suggests a more site-specific focus as a direction for future works. Each of these pieces would have been much stronger with a carefully selected and considered architectural space.

Two Women was built specifically to be installed into a white cube or a gallery, space. The purpose of this research was to explore the cinematic experience in installation setting. However, the piece could also benefit from a site which has some history which relates to the narrative; the architectural site could complete the artwork in a compelling way because it would carry its own memory and history.

4.3 Conclusion

Two Women ended up being radically different than how it was originally conceptualized. Over three years of effort, research, experimentation, challenge, collaboration, and execution, *Two Women* was polished and realized. The process was as crucially important as the final result.

Due to the overall complexity of the piece, the learning curve was steep, challenging, and difficult. Handling complex logistics, constantly negotiating with material and system design, and communicating with artists from many different fields was certainly a great opportunity to gain new skill sets. Through the production of the piece, an enormous set of resources, material, and skill sets were surfaced for the generation of future projects.

The questions outlined in Chapter 3, Art Methodology included:

- How can a video installation utilize space?
- How does the representation of time occur through artwork in physical space?
- How does imagery achieve an embodied experience?
- How is narrative conveyed in an installation situation?
- What are the methods of incorporating media technology in order to expand the viewing experiences in an installation?

It's safe to say these are still open questions and rich territory for research. The research conducted for the production of *Two Women* benefited enormously from a body of prior artwork, writing, and thinking. The piece was not generated spontaneously. However, the synthesis of varied disciplines and the numerous experiments conducted along the way, could hopefully be considered a meaningful contribution to the field of media art.

APPENDIX A
DIGITAL MATERIALS

The following table contains all the digital materials of *Two Women* including source code, audiovisual components, and the documentation of the two versions of the installation from *Currents 2015: The Santa Fe International New Media Art Festival*, and the DXARTS warehouse in Ballard, Seattle. The author will try to maintain an external copy of the documentation, however, there is no guarantee of long-term preservation of the external links.

Description	Links
(Source code) Main Control	http://hanalee.me/dissertation/source_codes/main_control/
(Source code) Machine control	http://hanalee.me/dissertation/source_codes/machine_control/
(Source code) Video player	https://github.com/jamezilla/PiOscVideoPlayer
(Source code) Subtitle player	http://hanalee.me/dissertation/source_codes/subtitle_player/
Video files	http://hanalee.me/dissertation/videos/
Data (News archive and Story)	http://hanalee.me/dissertation/data/
Audio files	http://hanalee.me/dissertation/sounds/
Photo documentation files	http://hanalee.me/dissertation/photodocumentation/
Video documentation: <i>Currents 2015: The Santa Fe International New Media Art Festival</i>	https://vimeo.com/132284046
Video documentation: DXARTS Ballard Warehouse in Seattle	https://vimeo.com/162017766

Table A.1: List of digital materials

APPENDIX B

TWO WOMEN FICTIONAL STORY

Table B.1: List of subtitles

Chapter 1			
00:00:30	00:06:00	몇 평 남 짓되는 깔끔하게 정돈된 방.	A neatly organized room, a few square feet.
00:06:22	00:14:10	오래된 물건들과 텔레비전이 하나 있다.	There are old things and a TV.
00:14:25	00:20:18	그 위에 너 비 2자 정도 되는 창문.	Over the TV there is a window about 2 ja wide.
00:21:14	00:29:03	그곳으로 실가락 같은 옅은 빛이 들어온다.	Through the window, thin pale light comes into the room.
00:30:13	00:37:11	누런 벽지에 새겨진 국화꽃들이 고개를 들어	The sallow chrysanthemum flower printed wallpaper is watching the lights
00:37:20	00:45:11	입사귀가 잘린 채 그 빛을 보고 있다.	without knowing its leaves are cut off.
00:46:17	00:51:00	창문 밑에 보이는 고동색 옷장.	An old copper-colored wardrobe sits under the window.
00:51:14	00:55:01	기울어진 조그만 책상.	Next to it, a small crooked desk
00:55:21	00:59:09	그리고 등받이가 있는 의자가 있다.	and a chair with a backrest.
01:01:15	01:08:03	바닥은 군데군데 짙은 얼룩이 묻어나고,	The floor has dark stains in places which appear
01:09:03	01:15:22	그 모습은 버섯이 꽃봉오리가 핀 것 같다.	as if mushrooms are blooming.
01:16:05	01:21:03	벽지는 군데군데 탕이 났고,	The wallpaper is black with mold,
01:21:12	01:30:06	벽지 사이사이 회벽의 느낌은 싸늘하다.	and the plastered wall between the tears in the paper feel cold.
01:30:20	01:36:21	시곱바늘은 기다림 없이 흐르고,	While clock hands are ticking without hesitation,
01:37:00	01:44:19	그 밑으로 나를 보는 거울이 있다.	there is a mirror looking at me below the time.
01:45:22	01:52:29	난 거울을 통해 방을 한 번 더	I look into the room through its reflection.

		들어다본다.	
01:53:23	02:03:09	거울 속에 있는 방은 왠지 비좁고 어둡다.	The room in the mirror looks smaller and darker.
02:03:26	02:12:14	창문 너머로는 공사장의 드릴 소리와 자동차 클랙슨 소리가 들린다.	Through the window I hear construction drilling and the sound of car horns.
02:13:01	02:22:17	공사판 사람들과 이웃 주민들의 가래 뱉는 소리가 무성하다.	Workers and neighbors are constantly spitting phlegm.
02:23:05	02:27:11	천장에서 뛰어노는 애들 소리.	Although the sounds of kids jumping in the apartment above
02:27:12	02:33:21	복도에서 들려오는 아가씨들의 날카로운 구두 소리.	and of a young lady's high heels in the corridor
02:34:02	02:46:26	이 모든 소리가 불협화음을 이루면서 귀를 자극하지만...	are sharp and irritate my ear,
02:47:23	02:59:17	내 얼굴의 표정은 주변 소리에 익숙해졌는지 아무런 미동도 없다.	the expression on my faces does not react.
03:03:14	03:07:15	의자에 앉는다.	I try to sit on the chair.
03:07:16	03:13:13	의자에 앉는 건 시간이 많이 걸리는 일이다.	It takes a while to sit down.
03:14:29	03:22:19	왼쪽다리에 불편함으로 손이 없이는 앉을 수가 없다.	I can't do it without using my hand because of the discomfort in my left leg.
03:22:20	03:29:20	손을 바닥에 대고 오른쪽 다리를 먼저 뻗는다.	First, I place a hand on the floor, and put my right leg out.
03:30:22	03:38:19	한 손으로 몸을 지탱할 수 있는 게 신기하다.	It's amazing that you can support yourself with one hand.
03:39:19	03:44:00	온몸에서 식은땀이 흐른다.	Cold sweat starts flowing from my body.
03:45:00	03:54:01	난 온몸을 집중한 후 의자를 당겨서 겨우 몸을 돌린다.	After concentrating on the move, I pull the chair, rotate my body slightly.

03:55:17	04:01:14	드디어 앉는데 성공한다.	Finally, I sit.
04:02:29	04:12:03	한 번에 한숨이 오가고, 폐부에서부터 신물이 올라 온다.	One sigh escapes, then my breath catches in my throat.
04:13:12	04:18:26	또 한 번 긴 한숨을 내뿜는다.	Then a longer sigh.
04:19:29	04:26:18	가슴을 툭툭 치며 마음을 안정시킨다.	I tap my heart through my chest, and try to stabilize my mind.
04:26:19	04:40:00	텔레비전을 켜다.	I turn on the TV.

Chapter 2			
00:00:00	00:03:03	위——잉... 위잉.	wi——ing...wi-ing.
00:03:04	00:06:00	스스스 탁탁.	sksksk taktak.
00:06:26	00:09:24	스스스 탁탁.	sksksksk taktak.
00:10:14	00:16:24	방 안에서 들려오는 싸늘하고 거친 소리.	Cold and harsh sound comes from inside of the room.
00:17:16	00:26:00	귀에 익숙하지만 정확한 소리는 분간 할 수가 없다.	I hear something familiar, but I cannot tell what it is.
00:27:18	00:30:20	난 잠에서 깬다.	I wake from sleep.
00:31:01	00:37:29	거울 속에 비친 방은 좀 전과 다르다.	I notice the room in the mirror looks different than before.
00:38:01	00:42:17	두 개의 상이 놓여있다.	There are two tables.
00:43:15	00:50:28	두 개의 상 머리 부분에는 하얀 두루마리 천이 말려있고	Scrolls of fabric are laid at the head of the tables.
00:51:02	00:59:25	어떤 움직이는 물체가 바늘로 천을 찌어대고 있다.	Some moving object with a needle punches holes in the fabric.
01:01:23	01:06:26	그 물체는 재봉틀 모양 같기도 하고,	The object is like a sewing machine,
01:06:27	01:12:25	언뜻 보면 인쇄기 같기도 하다.	at first glance like a printing press.

01:13:19	01:20:17	바늘로 찍는 천의 크기는 너비가 4자 반 정도 되고,	The scrolls are 4 ja wide, and hang 10 ja high.
01:21:05	01:34:24	10자 정도의 높이에 매달린 긴 족자 두루마리 모양으로 길게 늘어 드러있고,	They appear like Chinese paintings.
01:35:04	01:40:02	그 밑 사이로 관이 놓여있다.	Beneath them there are trays.
01:40:24	01:48:14	바늘은 좌우로 움직이면서 구멍을 뚫고 있다.	The needles move right and left while punching holes.
01:49:24	01:55:04	처음에는 같은 방향으로 움직이는 듯했으나...	At first they move together,
01:56:15	01:58:27	시간이 지날수록	but as time passes,
01:58:27	02:09:07	다른 방향, 속도로 움직이며 구멍을 찍어댄다.	I realize the speed, phase, and direction are different and contradictory.
02:10:24	02:15:03	관이 있는 곳을 향한다.	As I come close to the trays,
02:15:15	02:24:11	내가 관에 다가갈수록 관속에서 흐르는 물소리가 들린다.	I hear the sound of water.
02:25:26	02:31:11	관에 있는 물은 유기적으로 흐른다.	It moves gently in the tray.
02:31:26	02:39:05	매달린 종이에서 관으로 물방울이 떨어진다.	Droplets fall from the paper into the water.
02:40:15	02:42:24	물방울의 파동.	Waves of droplets,
02:43:27	02:47:25	서걱거리는 종이에 마찰음.	the rustle of crunching paper,
02:48:28	02:53:16	바늘이 종이의 표면을 뚫는 소리가	penetrating sound of needles,
02:54:00	02:56:08	아주 미세하게 들리더니	all sound very fine.
02:57:07	03:02:06	반복적 미세함이 내 살갓을...	The repeating fine sound...
03:03:25	03:10:25	비릿한 물 냄새가 내 심장을 죄어온다.	and pungent smell fill my head and tighten my chest.

03:14:09	03:23:07	가슴을 툭툭 치지만 진정이 안 된다.	Again, I tap my heart through my chest, but I can hardly calm down.
03:23:08	03:33:09	소리를 질러보지만 소리가 밖으로 나오지 않는다.	Though I try to scream, sound doesn't come out.
03:33:10	03:41:25	나는 두려움에 눈을 감는다.	I close my eyes in fear.
03:42:06	03:48:17	손이 떨리는 미동이 사라지기만을 기다린다.	I wait for my hands to stop shaking.
03:49:09	03:56:20	난 손을 맞잡는다.	I hold them together,
03:57:15	04:03:23	미동은 점차 줄어들다.	and the tremors gradually fade.
04:04:15	04:11:22	내 손에 뾰족한 사각기둥이 느껴진다.	I feel a sharp square edge.
04:12:21	04:19:29	모서리에 뾰족함을 손으로 어루만진다.	I carelessly touch the point
04:20:10	04:28:18	난 살며시 눈을 뜬다.	and gently open my eyes.
04:29:13	04:36:14	관안에 있는 물은 짙은 검은색을 띠고 있다.	Inside of the tray, the water is tinged a dark black.
04:36:15	04:43:15	그 검은 물이 날 비추고 있다.	That black water reflects me.
04:44:15	04:49:19	관으로 물방울이 떨어진다.	Droplets fall into the black water,
04:49:20	04:58:20	물방울이 떨어질 때 검은 물에 파동이 일어난다.	making small waves in the dark surface.
04:59:02	05:15:27	그 파동 밑으로 젊었을 때 내 모습이 보인다.	Beneath the waves, I see myself, younger.
05:16:15	05:23:07	난 젊었을 때 내가 반갑다.	I welcome my younger self.
05:23:20	05:32:04	그녀를 잡으려고 관속으로 손을 집어넣는다.	I put my hand in the tray to grab her.
05:33:15	05:39:06	관속에 그녀는 나를 보며 웃는다.	She looks up at me and smiles.
05:40:11	05:46:02	난 검은 물속으로 얼굴을	I put my head into the water.

		집어넣는다.	
05:46:03	05:52:01	난 그녀의 입모양의 떨림을 본다.	I see her lip quiver.
05:52:21	05:59:12	그녀와 나의 눈동자가 마주친다.	Our eyes catch each other.
06:00:04	06:06:18	그녀는 다시 한 번 입모양을 움직인다.	She moves her lips again.

Chapter 3			
00:00:00	00:02:29	눈을 감아본다	I close my eyes to see her,
00:03:28	00:08:08	그녀가 보이지 않는다.	but she is not there.
00:09:01	00:11:11	눈을 떠본다.	I open my eyes to look for her,
00:11:20	00:15:10	그녀가 보이지 않는다.	but can't see her there either.
00:16:12	00:21:05	그녀는 왜 내게 나타났을까?	Why does she appear to me?
00:22:15	00:27:23	내게 무슨 말을 하려고 했을까?	What did she try say?
00:28:23	00:32:08	갑자기 두려워진다.	Suddenly I am afraid.
00:32:29	00:36:11	온몸이 떨리는 것 같다.	My body starts to shake
00:37:12	00:39:28	비릿한 물 냄새.	A musty odor from the water.
00:39:29	00:44:25	내 살갓을 찌어대던 바늘이...	The needles, punching my skin,
00:44:26	00:49:03	내 뇌의 신경을 찌어대는 것 같다.	are now punching the nerves in the brain.
00:50:00	00:53:08	목구멍으로 구역질이 올라온다.	My throat aches in every part.
00:54:15	00:58:23	난 그 자리에서 쓰러진다.	I fall in place.
00:59:29	01:03:09	손을 움직이려고 해도 움직이지가 않는다.	I try to stretch my hands, but they are not working.
01:04:16	01:08:00	내 생각이 몸에 전해지지 않는다.	I try to stretch my hands, but they are not working.

01:09:21	01:16:27	난 쓰러져 눈물 만 흐른다.	My tears fall.
01:17:02	01:28:25	창문 안으로 빛이 스며든다. 난 실가락 같은 빛을 바라본다.	I gaze at the pale light coming through the window.
01:29:22	01:39:16	거울 속에는 젊었을 때에 내가 빛을 보고 있다.	Reflected in the mirror, I see my younger self looking at the light.

Chapter 4			
00:00:00	00:02:06	파란 하늘과 구름.	Blue sky and clouds.
00:02:06	00:08:24	구름에 일부가 가려져 바다에 비추는 실가락 같은 빛.	Thin light through the clouds illuminates the ocean.
00:09:29	00:14:01	맑고 투명한 바다.	Crystal clear water.
00:15:17	00:18:12	그녀는 바닷속에 있다.	She is under the ocean.
00:19:00	00:25:24	빛을 맞으며 점점 밑으로 내려가고 있다.	While the light shines on her face, she slowly sinks down.
00:26:03	00:30:04	난 그녀와 눈동자가 마주친다.	Our eyes meet,
00:30:16	00:36:01	그녀는 날 살며시 바라보고 웃는다.	she smiles slightly,
00:37:07	00:42:19	나도 그녀를 보고 어색하게 웃는다.	and I hesitantly smile back.
00:46:02	00:49:16	그녀가 입모양을 움직인다.	She moves her lips. I
00:49:22	00:53:06	난 그녀의 말을 느낌으로 알 수 있다.	I can almost understand her words.
00:53:17	00:59:28	그녀는 날 위로하는 것 같다.	I feel comforted,
01:00:04	01:03:21	두려움이 사라진다.	and my fear begins to ease.
01:04:14	01:07:29	온몸에 긴장이 풀린다.	The tension in my body loosens.
01:08:25	01:15:26	체내에 있는 온기가 빠져나가는 것 같다.	The warmth in my body leaves.

01:16:22	01:25:19	맑고 투명한 바다가 검은색 물로 바뀐다.	The crystal clear water turns black.
01:26:08	01:30:03	나른함이 밀려온다.	I feel a drowsiness descend.
01:30:26	01:34:29	눈꺼풀이 무겁다.	My eyelids are heavy.
01:35:11	01:38:12	그녀가	She is
01:39:20	01:45:01	내 시야에서 보이지 않는다.	out of my sight.

APPENDIX C

TWO WOMEN NEWS ARCHIVE

Table C.1: List of news archive

54 news archives in English				
June 1, 1926	Articles this year: 550	Discord between mother-in-law and daughter-in-law leads to suicide by pufferfish eggs	Hak-sun Kim(46) from the city of Tongyeong, South Gyeongsang Province was found dead at 4pm by tetraodontidae eggs. While she was suffered from poison, the family found her and brought her to ER immediately; however, she did not make it. The reason of her suicide is a conflict between her mother-in-law who believes that Hak-sun didn't properly treat the mother-in-law. Just like other days, they had disputed and confronted badly. After the incident, Hak-sun ate tetraodontidae eggs with alcohol.(Tongyeong)	- The Dang-A Daily News -
August 10, 1926	Articles this year: 550	Mother killed a daughter and herself.	Jung-mok Lee's wife(29) killed her daughter Guyyoe(2) by suffocation and killed herself by stabbing in the neck with a razor while her husband was away from home. She had been suffering from acute pleurisy since last year and was despondent about her immobility. Her daughter, Guyyoe, was mentally handicapped and she was afraid the daughter would become a burden to the father. So, she killed the daughter before killing herself.	- The Dang-A Daily News -
February 25, 1926	Articles this year: 550	Man crying at the foot of a mountain and then throwing himself under a train	The real tragedy of poverty. Hak-bum Kim(31), of Seosungri, Gopyung-myun, Pyungnamdedong-gun, committed suicide at the Gyeongui Railway. Because of his small income, his family has barely made a living and always suffered from hunger. Recent, Kim was fired from the factory and had no where else to work. He attempted to work as a frame bearer for a few days, but he only made 10 cents for 10 to 20 days work. His circumstances became dire and he was unable to improve them. On the day he killed himself, he sat near the mine all day, crying. Then he jumped onto the train tracks in front of the high speed south bound train. (Pyungyang)	- The Dang-A Daily News -
April 29, 1927	Articles this year: 606	An elderly father went out in the middle of the night and never returned	Se-chang Ahn(68), a resident of 49 Ahhyunbuk-Ri, told his wife at 3am he was going to the restroom. He never returned. Ahn's wife looked for him everywhere in town and finally found him dead, hanging from an evergreen. The speculation about the suicide's motivation is that Ahn was depressed about life, especially the departure of his son Ki-jung who ran away on March 20th. Ahn was in despair about his son's absence.	- The Dang-A Daily News -

January 30, 1928	Articles this year: 433	On the use of lye in women suicides	Committing suicide by ingesting lye is very common and popular way of dying among Josun (Korean) women. Ninety-nine out of a hundred women choose to ingest lye to kill themselves. A woman may have a million reasons to kill herself but suicide is hardly a morally acceptable act in society. If it has to be done, it needs to be done thoroughly and completely. Ingesting lye is not a good solution as it causes a great deal of pain and suffering. If the purpose of suicide is to avoid suffering, ingesting lye is a bad way to do it. The use of lye illustrates the lack of scientific knowledge among Josun (Korean) women. In an article in a daily newspaper about a woman's suicide, it is ridiculous to think that a woman thinking about suicide believes that the pain in her life will be worse than the pain of ingesting lye. The suicidal woman may have no time to spare, but perhaps one good thing to consider is the humiliation of an unsuccessful suicide attempt by ingesting lye.	- The Dang-A Daily News -
August 8, 1929	Articles this year: 549	A old man's unknown death	On 4th of August around 4pm in Gorangpo-ri, Jangnam-myun, an old man, Dong-hyung Jung(62) suddenly went out of his house and drowned in the Imjin river. The police chief of the local police, accompanied by a doctor, examined the corpse. The cause of death was suicide. The old man seemed to be wealthy, so the police are still investigating the case.	- The Dang-A Daily News -
March 3, 1930	Articles this year: 365	The reason of one man's death	A hostess, Bok-sun Park(18) and her husband Won-sun Lee(22) attempted suicide in Anseongwan restaurant, located in Saribuk-ri in Hwanghae-do. He recently acquired for his wife a four year contract working at the Anseongwan restaurant for the amount of 500 won (five time as much as a typical doctor's salary). He got an advance payment of 280 won in cash, but ran out of money quickly in just a few days. He came at last to the restaurant, and convinced his wife to commit suicide together. He injected his wife and himself with morphine, but only he died. He was apparently a morphine addict.	- The Dang-A Daily News -
April 3, 1931	Articles this year: 604	Because of loved son's early death	Gyung-lim Lee(33), who is the wife of Sung-jae Kim in Goseung-ri, Boun-Gun, Tanbu-myun committed suicide 20th because of her loved son Ki-dong's death. She was very depressed since her son's death, and the house financial circumstances were dire. She took bitterns.	- The Dang-A Daily News -
January	Articles	One	The first son, Sang-ta Jung(16) from the Jung kyung-su family	- The Dang-A

14, 1932	this year: 543	unemployed boy's death	in Chungsu-jung, Chungju-ep hung himself from the crossbeam in his room around 5pm. The actual reason for the death is unknown. The investigation showed that he graduated from the high school, and liked to help the poor household. He worked as a store clerk and other jobs in the fall, but was still frustrated and depressed about his life.	Daily News -
October 3, 1933	Articles this year: 756	The most painful holiday	A woman hugged her two children and ran in front of the train. A few days before Thanksgiving, a woman ran in front of a train with her two children because of an extremely poor household. At 9:40pm, the train, leaving from Songjungri to Gwangju, was approaching 300 meter before the daily labor working mother, named Jang-do Ki, killed herself and her children. The mother and one child went under the wheel of the train and died instantly. The new born baby narrowly escaped death. The situation was terrible and unbearable to witness.	- The Dang-A Daily News -
April 5, 1934	Articles this year: 847	Eighty-year-old woman falls into a big water jar	Yong-rae Park's mother, Jang (75), who lived at 373 Hangang-ri in Seoul, fell headlong to the bottom of the water jar while no one was at home. The size of the water jar was about 150cm. The mixed motives behind the suicide were economic hardship and chronic sickness. Plus, she was tormented by the thought that her existence would be a great burden to her son.	- The Dang-A Daily News -
October 17, 1935	Articles this year: 748	Frustration with chronic disease	Se-moon Jung (45), from Hamduk-ri in Jejudo, hung himself in his house. Three years ago, he contracted a severe disease and had since been living in pain. To make matters worse, he started having mental issues. Though the family nursed him devotedly, his condition didn't get better. Therefore he grew very frustrated and committed suicide.	- The Dang-A Daily News -
March 10, 1936	Articles this year: 603	Old couple's suicide	Tae-won Kim (73) and his wife, Yeo-mu Kim (60), residents of Youngam-gun in Jeonnam-do, had no descendants and lived poorly. On the night of March 4, the couple had an altercation. The wife committed suicide by ingesting lye. Then, the husband committed suicide the same way.	- The Dang-A Daily News -
February 8, 1940	Articles this year: 258	Suicide attempt on a Gwanbu cruise ship	In these days, suicide attempts are a frequent event. In February, within three days, there were two suicide attempts. On February 5, around 10 pm, Deok-su Lee's sister Young-mae (21) left her belongings in the third cabin of the Gwanbu cruise ship and committed suicide by drowning. The motive	- The Dang-A Daily News -

			was a pessimistic view of life.	
December 26, 1947	Articles this year: 42	Patriotic young man's suicide attempt	A young man, deploring the independence of the country, attempted to disembowel himself. Around 4 pm on December 24, at Tapgol Park in Jongro-gu, an inspection patrol found a young man injured and brought him to the ER at the Chol-sung Jang hospital. The young man barely survived. His name is Ki-su Lim (26), and he was born in Hannam Hengnam. After he graduated from the Hamheung College of Education, he lived in China. On his way home, he was very disturbed by the independence of the country. The wound is about 12 cm long and 1.5 cm deep; the estimated recovery time is about 10 days.	- The Kyunghyang News -
September 11, 1953	Articles this year: 221	Wrong myth leads to suicide	A woman committed suicide because of superstition. Sun-ja Hong, of Donamdong 69-35, Seoul, took a large dose of quinine. Hong's motive for the suicide was about a new love. Hong's husband, Kim, reportedly called on January 4 from a retreat in 1951. Since then, there had been no news from him. More recently, Hong had planned to marry Byun. Hong's mother went to see a fortune teller and the result came that her husband is still alive and will return to home.	- The Kyunghyang News -
September 30, 1954	Articles this year: 204	Swallowing rat poison	Mun-jun Ko's wife, Chun-ja Gwan (21), from Cho-em-ri, Idongmyun, Namhae-gun, committed suicide by swallowing American rat poison at midnight on September 18, eventually dying at 8 am on the 19th. The reason for the suicide is still unknown.	- The Kyunghyang News -
December 25, 1955	Articles this year: 323	A herd of whales's suicide	On December 25th, about 300 whales were found on the coast of Tasmania, Australia. The local fishermen tried to return them to the water, but their efforts were futile because all of the whales were already dead on the ground. Among them, some were up to 25 feet in size. One authority announced that whale suicides have occurred a few times before.	- The Kyunghyang News -
December 25, 1956	Articles this year: 537	Twenty-one cases of suicide over twenty-three days	The Seoul City Police Department reported the number of suicides over 23 days: eleven men and ten women. The main cause of suicide was hardship of life, which portrays the contemporary social problem. The popular method of suicide was to take poison.	- The Kyunghyang News -
July 17, 1957	Articles this	Inability to be	In 1957, the total number of articles using the term "suicide" was 757. A sergeant who was very upset about not being	- The Kyunghyang

	year: 757	discharged from military	discharged from the military attempted suicide, and a retired soldier committed suicide by ingesting lye due to the hardship of unemployment. Three soldiers have committed suicide in the last fifteen days, which reveals significant social problems.	News -
August 1, 1959	Articles this year: 584	Three suicide incidents in a day	The landlady who owns Namsanjang Inn at Sinmun-ri 82, Kanghwa-myun, Kangwha-gun, Kyung-suk Park, complained about the number of recent suicides at her business. Unidentified customers, a man (23) and a woman (24), checked into a room the night of the 26th and were found dead on the morning of the 29th. That same day around 7:30 pm, Jae-duk Kang (33) from Il-gu Songhyun-dong in Incheon got a room and took a massive amount of poison to commit suicide because he was suffering from the hardships of life. At midnight, for the same motive, Tae-hong Song (49) from Mansuk-dong in Incheon also checked in and committed suicide by hanging himself with a shoelace in his room.	- The Dang-A Daily News -
April 29, 1960	Articles this year: 425	Death of the Lee family	At the Blue House (the "White House" of South Korea) on April 28th, Kang-suk Lee (24), first President Syngman Rhee's adopted son, shot the members of his family and himself. In the President's secretarial office 3365, Kang-suk first shot his father, Ki-poong Lee (66), and then his mother, Maria Park (55), his brother, Kang-uk Lee (21), and lastly himself. The details of his motive are still unknown; however, two days ago, Kang-suk insisted that the family could only apologize to the nation by dying.	- The Dang-A Daily News -
June 4, 1961	Articles this year: 626	Mother and three daughters drown themselves	Four women drowned themselves in a pond because of financial hardships. The family, Bong-sun Park (53, mother), Kun-ja Kim (29, daughter), Young-ae (17, daughter), and Gwang-ja (9, daughter) lived in Nanguk-ri, Hwangkan. Currently, the bodies of Park and her eldest daughter have been found, but the other two have not been recovered. The causes given for their suicides were the hardships of life and family troubles with a son-in-law.	- The Dang-A Daily News -
October 19, 1962	Articles this year: 447	Poet Park Heup's suicide	The poet Heup (51, Gwangju Jungang Women's high school teacher) left a last will of five pages to his two sons and relatives. The will noted his despair and tiredness of living such a dull life. Park took poison on the morning of the 17th. He had been separated from his wife, so the family of the deceased is only the two sons.	- The Kyunghyang News -

February 18, 1963	Articles this year: 495	Runaway soldier's death	Two young men, estimated to be in their early 20s, ingested poison and were found groaning at the foot of Baekun Mountain at 3 pm on February 17th. The local police found and immediately transported the two men to the local hospital. One man has been pronounced dead and the other is in critical condition. The deceased was apparently a runaway soldier and a close friend of the man in critical condition. Since the patient is still unconscious, the motive behind the two friends' suicide fact is still unknown.	- The Kyunghyang News -
October 20, 1966	Articles this year: 565	Buddhist nun's suicide. Save us, merciful Buddha!	Buddhist nun Jung-bun Kim (43) took poison and left a will, writing "Be merciful, A chief monk. I worried to die at the local village because of a groundless rumor. Therefore, I choose to die here at Bomunsa, the Buddhist temple in Bounding-3ga in Seoul. Please forgive me." Nun Kim lost her husband 13 years ago and became a Buddhist nun. Questions will be raised about why a Buddhist nun would commit suicide. Save us, merciful Buddha!	- The Kyunghyang News -
December 23, 1967	Articles this year: 169	Massive number of frogs committed suicide while the "toad war" was happening.	On the 22nd of December, a thousand frogs committed suicide by jumping into thorny vines at Nakh Natchasima village in a northern province of Thailand. Two different groups of toads, numbering to about one million, had a brutal war and left a lot of corpses in Sratnai, a village in a southern province. A similar incident has happened before when the Japanese army invaded the country.	- The Kyunghyang News -
August 16, 1968	Articles this year: 427	Mother with leprosy kills her children and commits suicide	Kyung-ja Lee (26), wife of Man-bae Kim (31), was a resident of Oksudong 4-ga 380 in Seoul. Lee was depressed about her leprosy diagnosis, and she killed her daughter, Hyo-sun (2) and son Hyu-suk (1) while they were sleeping. The mother strangled them and then killed herself. Lee had been suffering from a sickness that was not diagnosed until the previous June. She found out the name of her disease from Sungmo Hospital and decided against passing on the same disease to her children. Lee was married to Kim for three years, and their marriage seemed to have been a happy one.	- The Kyunghyang News -
November 24, 1969	Articles this year: 397	A lesson of child's suicide	On the 18th of November, an elementary student took agricultural pesticides to commit suicide in Seoul. The motive of suicide is because of overdue of three months school fees and other miscellaneous fees. The reason doesn't matter	- The Kyunghyang News -

			because child's promising and bright future got destroyed and died by will are just shocking facts. The boy has a family and the school, but chose a drastic way of dying. Then we should wonder what the school does or the family's love. In addition, what are the Seoul Metropolitan Government and the Minister of Education doing? What do they think of this boy's suicide?	
November 23, 1970	Articles this year: 537	Forming a task force to investigate Tae-il Jeon's suicide	The New Democratic Party announced an intensive investigation into the reasons that Tae-il Jeon, a textile factory worker at the Pyeonghwa Market in Seoul, set himself on fire, and why students at Seoul National University protested against the issues of labor-management relations. Through the National Assembly Budget Office, improvement for the amendments of labor terms will be established as a fundamental policy. Spokesperson Soo-han Kim announced today that the investigation team will include Chairman Do-youn Ju; legal experts Myung-hwn Lee, Youn-gi Hong, Jun-ki Sa and National Assembly Standing committee member Sang-hyun Kim; Judiciary committee members Han-sang Park and Yeond-rok Park; plus seven additional members who started a fact finding mission on November 20th.	- The Dang-A Daily News -
January 20, 1971	Articles this year: 522	Mother and son commit suicide after chronic carbon monoxide poisoning	Won-woo Lee (20) and his mother, Bu-ja Kim (79), from 386-4 Sillim-dong, Yeongdeungpo-gu in Seoul, committed suicide together after long battles with chronic carbon monoxide poisoning. According to Lee's elder brother, Sun-woo (58), Won-woo had suffered from nephritis for the last two years, and wasted his family's fortune on possible treatment options. On January 17th, Won-woo received a diagnosis from the central medical center that his chances of recovery were not good. He returned home and committed suicide, together with his mother.	- The Dang-A Daily News -
April 24, 1972	Articles this year: 444	Death of Ambassador Soo-young Lee	On the 22nd of April, French Police reported that the Korean Ambassador to France, Soo-young Lee, committed suicide by stabbing himself in the stomach. Ambassador Lee was found by his son and a housekeeper at his apartment on Montaigne Street in Paris. He was immediately transported to the hospital, but passed away before he could receive medical attention. The police added that Ambassador Lee had been suffering from neurotic depression. The spokesman from the Korean Embassy couldn't believe the suicide announcement, and noted that the cause of death was still undetermined.	- The Kyunghyang News -

July 9, 1975	Articles this year: 462	Expensive wedding presents and postponed wedding lead to suicide	Jin-ok Choi (26), of 48-98 Heukseok 2-dong, Gwanak-gu in Seoul, was found suffering from deadly poisoning at 12:30pm on the 8th of July. Her father immediately took her to nearby Heukseok St. Mary Hospital, but she passed away before she could receive medical attention. According to the family, Ms. Choi became disillusioned with her fiancé, who demanded that Ms. Choi purchase expensive house appliances, such as a refrigerator and a television, before finally postponing the wedding. Ms. Choi had an introverted personality so this may be the reason for her suicide.	- The Kyunghyang News -
December 7, 1976	Articles this year: 404	Suicide after 13 years of family separation	Jae-moon Do (63) was found by his wife Kyung-suk Kim (53) at 3am on the 7th of December, after he had taken a deadly poison. Though she rushed him to a nearby hospital, Mr. Do passed away before he could receive medical treatment. According to his wife, Mr. Do felt very lonely and isolated since their son Jin-hoo (43) left to work as a miner in West Germany. Mr. Do periodically mentioned his distress about his relationship with his son and even talked about suicide. The couple lived apart from their son's family for the last thirteen years. Although their daughter-in-law and grandchild frequently visited them before their relocation to West Germany, the family never contacted them or provided financial assistance after the move. In addition, Mr. Do and his wife had taken on a heavy debt burden.	- The Kyunghyang News -
December 21, 1979	Articles this year: 359	A lesbian female teacher and her student attempt double suicide	Sung-rae Jang (24), an English Teacher at Jeonnam Mokpo M Girls' Vocational High School, and her student (18) attempted suicide together by taking tranquilizers. At around 7:30pm on December 20th, they checked into room 714 at the New Seoul Hotel, 29-1 Taepyeongno 1-ga, Jung-gu in Seoul. They were found in critical condition by hotel cleaning lady, Myung-hun Sung (40). According to the student, they stayed in the room one night. They briefly went out, returned and took a poison. Ms. Jang left her last will to the student, "Listening to the beautiful Chopin's piano concerto, I left alone, my love. Please live well. During the vacation, Ms. Jang planned to commit suicide in Seoul, and the student wanted to follow her.	- The Kyunghyang News -
September 9th, 1980	Articles this year: 440	Lonely old woman hangs herself	Sung-nyu Seo (86), of Eunma Apt. 20 #1208, Daechi-dong, Gangnam-Gu in Seoul, hung herself around 7pm on the 8th of September. Her son, Chang-sik Jun (42), returned home from work around 6pm and spent an hour cleaning up the	- The Kyunghyang News -

			apartment before he opened the door to his mother's room and found her hanging from bars in the window. According to Chang-sik, his Sung-nyu Seo had been living with her son's family for about a year. When the family left the house to go to work and school, Sung-nyu Seo stayed home alone and became very lonely. She grew increasingly pessimistic about life after her eyesight began to fail.	
April 22, 1983	Articles this year: 615	Student drowns himself because of bad grades	Chang-suk (14), the first son of Young-bae Choi (49) and a resident of Singongdeok-dong, Mapo-gu in Seoul, drowned around 2:20pm on the 21st of April. Another citizen, Soo-jae Jo (23), witnessed Chang-suk walking into the water under the bridge of the Han River. Mr. Jo chased him, but Chang-suk was dead before Mr. Jo could intervene. The police reported that, based on information from Chang-suk's teacher, he was a very introverted student, and he felt pessimistic about his GPA in school.	- The Kyunghyang News -
September 18, 1971	Articles this year: 522	Captured North Korean spy commits suicide	Around 7:50pm on the 17th of September, an unnamed North Korean spy around 40 years old was taken as a suspect to the Yangdong Police Station located at 87 Yangdong, Jung-gu in Seoul. The North Korean man was picked up when local police officers were randomly questioning people on the street. Police officers Jong-gwan Gwak (38) and Youn-sun Ko (43) stopped and questioned the unnamed North Korean man on the street in front of the Yangdong Police Station when they became suspicious of his bag. The spy tried to establish his identity with a fake identification card. When the officers attempted to look in the bag, the spy resisted. Police report that the man, who was in excellent shape, wore a red and white patterned shirt, black pants, and shoes, and spoke with a Seoul accent. Inside his pockets, the spy had three South Korean IDs from the different residents of Seoul, Busan, and Naju. While investigating, the unnamed North Korean committed suicide by stabbing his stomach with a fountain pen. The spy's belongings included a hand grenade manufactured in the Soviet Union, a pistol, a magazine, 40,000 won in cash, and several items of clothing.	- The Dang-A Daily News -
April 16, 1987	Articles this year: 709	Student hangs himself after losing	Jae-hwan Chang (23), a college student on a leave of absence from the Department of Social Welfare at Busan University, used electronic cords to hang himself from a pine tree at Oncheon 2-dong, Dongnae-gu in Busan, behind the	- The Dang-A Daily News -

		list of student activist names	Lucky Golf Club at the midpoint of Geumjeongsan Mountain, at around 7:10 am. According to police, Mr. Chang lost a bag containing a document listing the names of student activists on the 23rd of last month. He was worried that the student activists listed in the document would be the subjects of an intensive investigation. His last will was dedicated to the student councils at Busan and Dong-A Universities.	
October 9, 1989	Articles this year: 1086	One student commits suicide every three days	The number of safety accidents and suicides affecting primary, middle and high school students gradually increases every year. According to the Minister of Education's official announcement "Status of Student Problems", 102 students committed violent sexual offenses and 98 students were victims of sexual violence through the end of September. From March 1988 through February 1989, 126 mid-high/high school students committed suicide, resulting in one student suicide every three days. The most common causes of student suicide included family discord (39); severe scolding from parents (20); physical defects and unknown or chronic diseases (15); poverty (12); depression (12); being orphaned (9); and failure in school (7), among others. The number of juvenile assaults resulting in injury increased from 19,105 injuries in 1987 to 19,720 injuries in 1988, but the number of safety accidents, including traffic accidents and gas poisoning, dropped from 2457 accidents in 1987 to 1958 accidents in 1988. The Minister of Education also mentioned increases in smoking and drug abuse, but didn't disclose any statistics.	- The Kyunghyang News -
December 26, 1990	Articles this year: 1312	Debtor jumps from apartment building	Byung-Sun Lee (35), owner of a record store at 177 Bugahyeon-dong, Seodaemun-gu in Seoul, was found on the lawn of an apartment complex located in Sinjeong 6-dong, Yangcheon-gu. Jong-young Baek(50), the security officer who found Lee, heard a loud "kung" sound before investigating and finding Lee's lifeless body on the lawn. Lee's wife said that the cause of Lee's suicide was likely caused by his financial problems. After borrowing money from a friend, Lee had amassed a debt of over 7,000,000 won (70,000 USD), and his house was recently seized as a result. Lee visited his friend to appeal for an amicable settlement of the debt, and later jumped from the apartment building.	- The Hankyoreh News -

<p>January 16, 1991</p>	<p>Articles this year: 1727</p>	<p>Inhospitable treatment caused mother's suicide</p>	<p>Geum-sun Song (73), a resident of 49-2 Okgil-dong, Sosa-gu in Bucheon, jumped from the Duksan Hospital at 6:30am on the 15th of January. The hospital is located in 33 Oryu 1-dong, Guro-gu, Seoul. Police reported that the cause of suicide was related to the difficult relationship Song had with her children. Eight days ago, Song was hospitalized for the treatment of a skin disease, but her children rarely visited. According to Jung-ae Choi (60), a patient sharing the same hospital room, Song frequently complained about the indifferent treatment from her children and often talked about suicide.</p>	<p>- The Hankyoreh News -</p>
<p>September 14, 1992</p>	<p>Articles this year: 1534</p>	<p>Fearing the rapture, believer hangs herself from electrical tower</p>	<p>On September 11th, Jung-ae Gwak (32), of Munhyeondong, Nam-gu in Busan, hung herself with a nylon string on the tower of a high-voltage line behind the mountain village at Woryeong-dong, Masanhappo-gu in Gyeongsangnam-do. Gwak was found by a passerby who was on the way to his ancestral grave around 3:30pm. According to the police investigation, since Gwak has begun attending the Immanuel Eschatological Church located at 614 Woryeong 2-dong, she sold all her property and started living at the church with a family. Gwak left two letters of a will to the deacon of church, "Knowing Rapture on October 28th, I don't want to live any longer".</p>	<p>- The Hankyoreh News -</p>
<p>January 6, 1993</p>	<p>Articles this year: 1066</p>	<p>Small business CEO drowns himself</p>	<p>Bankrupted small business CEO, Sun-kang Hong (56), from 404-21 Galhyeon-dong, Eunpyeong-gu in Seoul, was found dead by drowning at 1:40pm at the upper region of the Bukhan River (water depth: 2.5m) in front of Deungseon Falls Chuncheon in Gangwon-do. Mr. Shin (48), a local villager, saw neatly organized a suite jacket, a coat and a pair of shoes on a cruise ship. After suspecting that someone had jumped into the water, Shin reported his discovery to the police. The police brought divers to search the nearby river and found Hong's dead body after a short search. His company produced and supplied small automobile parts. His company had recently faced difficulties due to a lack of financial support. On</p>	<p>- The Hankyoreh News -</p>

			December 30th, 1992, his company declared bankruptcy with debts over 3 million won.	
September 16, 1994	Articles this year: 1008	Misunderstanding as AIDS infection	At 6:30pm, Jung-sun Jo (45) stabbed and hung herself in her rented room at Sillim-dong, Gwanak-gu in Seoul. She was found by her stepfather Yang (70), of Jamsil-dong, Songpa-gu in Seoul, and transported to the hospital, but died before she could receive medical attention. Earlier that afternoon, according to Yang, Jo revealed that she had been infected with HIV. Therefore, her parents took her to see a gynecologist who performed an AIDS test. After the test, Jo returned home and committed suicide. On the 14th of September, the final result of the AIDS test showed that Jo was HIV-negative. The police reported that Jo separated from her husband three years ago and had started working as a teahouse waitress. Recently, Jo began to worry, and said, "I have AIDS. I have been losing a lot of weight. I can't live in the neighborhood because the villagers were blaming the infection." Unfortunately, this misunderstanding about her illness led Jo to commit suicide.	- The Kyunghyang News -
January 7, 1996	Articles this year: 4452	Kwang-seok Kim suicide	Pop singer Kwang-seok Kim (32) hung himself with an electric cord at 3:35am in the living room of his house at 398 Wonum Building 4th Floor, Seogyo-dong, Mapo-gu in Seoul. His wife, Seo (30) found him and reported his death to the police. After returning home around 12:30am, Seo drank four bottles of beer with him before going back to her room around 3 am to watch videos. When she didn't hear anything outside the room, she went into the living room and found Kim dead. Seo noted that Kim had experienced a devastating slump since his 10th anniversary concert, and often suffered from bipolar disorder after drinking alcohol.	- The Kyunghyang News -
July 10, 1997	Articles this year: 1343	Teenager victim of mob violence commits suicide in hallucinati	Ji-woong Yoon (18), a highschool dropout who was a victim of mob violence, jumped from the balcony of his apartment, approximately 60 meter high, in Cheonho 3-dong, Gangdong-gu, Seoul. Last month, when Yoon was sniffing glue with his girlfriend in the playground of an elementary school, five high school students in the neighborhood accused Yoon of being arrogant before	- The Kyunghyang News -

		on	violently attacking him. Yoon's jaw and teeth were broken, and he was seriously injured. According to the family, Yoon snuck out the hospital and sniffed glue before committing suicide.	
February 10, 1998	Articles this year: 1204	Preventing 'IMF suicide'	In the current economic depression, unemployment and bankruptcy are painfully impacting our life. Suicide occurs every day because of this economic catastrophe. A 40 year old father ran away a few months ago due to the shock of being fired, and has had no contact with his family since he left. Just as the father made a radical choice to run away, the children also easily gave up their studies. Thus, the family grows apart and the spouse gives up on life because of frustration and desperation. This economic hardship not only affects families but also shakes the fundamental structure of society. Recurring incidents of suicide and abandonment cause distemper and increase the psychological panic within society. An economy aimed at collecting and saving precious financial resources offers a much better alternative. The hope is there if you are determined to live. It is unfortunate when people can so easily choose to die instead of making an effort to improve their lives. To be honest, we must all take a look around our neighborhoods to better understand the suffering of our fellow citizens so that we can share their pain. The government must not regard suicide as an individual issue, but establish emergency measures to prevent these tragic losses before they continue unabated.	- The Kyunghyang News -
September 22, 1999	Articles this year: 1002	11 Industrial workers' suicide	Since the beginning of last year, a total of 18 industrial workers have committed suicide. According to the parliamentary inspection of the administration's report submitted to the Environment and Labor Committee, headed by Chul-hyun Kwon (the Grand National Party, Republican), seven industrial workers committed suicide last year. Eleven more have committed suicide in the	- The Hankyoreh News -

			<p>first eight months of this year. Nine of these workers committed suicide within a year after the occurrence of an industrial disaster. Congressperson Chul insisted that the suicide of Sang-kwan Lee, a victim of industrial disaster who lost his job in injustice by Daewoo Heavy Industries & Machinery Ltd., was caused by the withdrawal from the Korean Workers' Compensation and Welfare Service. He also predicted that there will be many more incidents like Sang-kwan Lee's case in the future.</p>	
July 1, 1920	Articles this year: 31	The hardship of life brings suicide.	<p>Young-tak Jung from downtown Gongpyeong-dong, frustrated by the hardship of life, drowned after falling into the Han river.</p>	- The Dang-A Daily News -
November 12, 1922	Articles this year: 31	The suicide by opium	<p>Sangsuk-Ko (28), a resident of 124 Insadong, was recently found unconscious by his wife. She brought a doctor to get emergency treatment, but his condition did not improve and he passed away shortly after. Ko, cousin of Ju-suk Ko, was very pessimistic about his life and likely committed suicide as a result of this depression.</p>	- The Dang-A Daily News -
October 26, 1923	Articles this year: 282	Suicide due to economic hardship	<p>At 5pm on the 24th of October, Ji-rye Kim (36), a metal worker in the city, took a solution of corrosive sublimate and committed suicide. The reason for this suicide was thought to be economic hardship and depression.</p>	- The Dang-A Daily News -
August 15, 1924	Articles this year: 327	Suicide after separation from her family	<p>Bo-boo Kim (19), of 12 Dongnim-ri, Yeonho-myun, Anju-gun, ingested lye and passed away on the 4th of August. Kim was having difficulty adjusting to married life and was badly missing her parents and siblings. She hoped to visit her family, but her family-in-law never gave her permission. Kim's suicide is thought to be due to depression regarding her difficult life away from her family.</p>	- The Dang-A Daily News -

APPENDIX D
TWO WOMEN INVENTORY

Table D.1 List of equipment and material for *Currents: The Santa Fe International New Media Art Festival*

Category	Count	Type	Item
Wallpaper	13	artwork	Wallpaper
	1	tools	Molding paste
	1	tools	Acrylic bottle
	2	tools	Sponges
	2	tools	Puddy knives
	1	tools	Staple gun
	1	tools	Staples
Spooler system	2	artwork	Spooler frames
	2	artwork	Spools
	2	artwork	Paracords (black strings)
	2	equipment	Stepper motor with gear
	2	tools	Black led light strips mount
	2	equipment	Led light strips
	2	equipment	12v 5a DC power + berrel jacks
	2	equipment	DC dimmers
	2	equipment	DC dimmers remote controls
	2	equipment	Power supply for motor
	2	tools	Small surge protectors
Punching system	2	artwork	linear rails
	2	equipment	Arduino 5v power cables
	2	equipment	Arduino
	2	equipment	USB cable
	2	equipment	ethernet cable
	2	equipment	SD cards
	2	equipment	Raspberry pi power supply
	2	equipment	Raspberry pi
	2	equipment	Stepper motor power supply

	2	artwork	Circuits
	2	artwork	Solenoids
	2	artwork	Punching rail for a table
	4	artwork	Puncher mounting plates
	2	artwork	Pond liners
	2	tools	Big surge protectors
	1	tools	Emergency patch for liners
	4	artwork	Mounting plates for hold-down rods
	4	artwork	Hold-down rods
Sound System	3	equipment	Y cable 1/8" male to 1/4" stereo
	3	equipment	1/8" female adapter
	6	equipment	1/4" audio cables
	1	equipment	Firewire cable
	1	equipment	Edirol Audio Interface
Subtitle System	2	equipment	Pocket projector mounts
	2	equipment	Black surge protectors
	2	equipment	Amazon HDMI cables
	2	equipment	Ethernet cables
	2	equipment	Raspberry pi
	2	equipment	Raspberry pi power supply
	2	equipment	SD cards
	2	equipment	Ethernet cables
	2	equipment	Pico Pocket Projectors
	1	equipment	Pico remote control
Video System	2	equipment	BenQ HD projectors
	2	equipment	BenQ HD projectors power cables
	1	equipment	BenQ remote control
	2	equipment	Raspberry pi
	2	equipment	Raspberry pi power supply
	2	equipment	Amazon HDMI cables
	2	tools	Surge protectors

	2	tools	Projector mounts
	1	equipment	Mac Mini
	1	equipment	Mac Mini power cable
	1	equipment	Keyboard and mouse
Tyvek	2	artwork	45" x 300' Tyvek rolls
Miscellaneous	1	tools	3M Tape
	1	tools	Black Gaffer's tape
	2	tools	Black Pelican cases
	1	tools	Soldering machine
	1	tools	Meter
	1	tools	allen wrench
Pool materials	8	materials	4' x 8' x 3/4" Plywood
	24	materials	2' x 4' x 8' Stud
	2	materials	Pond liners

APPENDIX E

VITA

Ha Na Lee was born in Seoul, South Korea. She works primarily in the mediums of video, new media, installation art, and experimental film. Her artwork focuses on portraying an individual's experience of psychological and physical trauma in a poetic narrative. She is especially interested in exploring these traumas by creating bodily and cinematic experiences and spatializing fragmented narratives in the form of interactive and immersive environments.

Lee's work has been exhibited in a number of solo and group exhibitions, and her films have been screened in the United States and internationally in South Korea, Japan, Taiwan, Puerto Rico, Spain, and the Netherlands. Lee and her collaborator James Hughes were invited to present their work at *Currents: The Santa Fe International New Media Art Festival* in 2014 and 2015. She recently received GAP grants at Artist Trust in 2015, in 2014 she was receive the dARTboard award from the Vilcek Foundation in New York, and was the recipient of the New York Foundation for the Arts Fellowship, the Goldberger Graduate Research Fellowship at Stony Brook University in New York, and others. Lee currently lives and works in Austin, Texas.

BIBLIOGRAPHY

Benjamin, Walter. "The Work of Art in the Age of Mechanical Reproduction." *Stardom and Celebrity: A Reader* (n.d.): 25-33. Web.

Bismuth, Pierre, Mike Sperlinger, and Ian White. *Kinomuseum: Towards an Artists' Cinema*. Köln: Verlag Der Buchhandlung Walther König, 2008. Print.

Cain, Geoffrey. "Why South Koreans Are Killing Themselves in Doves." *Saloncom RSS*. N.p., n.d. Web. 15 Mar. 2014.

Campany, David. *The Cinematic*. London: Whitechapel, 2007. Print.

Chion, Michel. *Audio-vision: Sound on Screen*. Ed. Claudia Gorbman. New York: Columbia UP, 1994. Print.

Chion, Michel. *The Voice in Cinema*. Trans. Claudia Gorbman. New York: Columbia UP, 1999. Print.

Connolly, Maeve. *The Place of Artists' Cinema: Space, Site and Screen*. Bristol, UK: Intellect, 2009. Print.

Costa, Pedro, Catherine David, and Chris Dercon. "Jan Van Eyck Video Weekend." *From Black Box to White Cube*. Trans. Maaïke van Stolk. N.p., n.d. Web. 20 Feb. 2013.

Crary, Jonathan. *Techniques of the Observer: On Vision and Modernity in the Nineteenth Century*. Cambridge, MA: MIT, 1990. Print.

Deleuze, Gilles, and Robert Galeta. *Cinema 2: The Time Image*. Trans. Hugh Tomlinson. London: Athlone, 1989. Print.

Doane, Mary Ann. *The Emergence of Cinematic Time: Modernity, Contingency, the Archive*. Cambridge, MA: Harvard UP, 2002. Print.

Frieling, Rudolf. "Media Art Net | Douglas, Stan: Win, Place or Show." *Media Art Net | Douglas, Stan: Win, Place or Show*. N.p., n.d. Web. 5 June 2012.

Galt, Rosalind, and Karl Schoonover. *Global Art Cinema: New Theories and Histories*. New York: Oxford UP. Print.

Kristeva, Julia. *Powers of Horror: An Essay on Abjection*. Trans. Leon S. Roudiez. New York: Columbia UP, 1982. Print.

Kristeva, Julia. *Black Sun: Depression and Melancholia*. Trans. Leon S. Roudiez. New York: Columbia UP, 1989. Print.

Lee, Hee-gil. "Status Analysis and Causes of Elderly Suicide" Korean National Statistical Office, 2007. Web. 13 Mar. 2014.

Gunning, Tom. "The Cinema of Attractions: Early Film, Its Spectator and the Avant-Garde", *Wide Angle*. Vol.8, nos. 3 & 4 Fall, 1986. Web. 2 April 2016.

Leighton, Tanya, ed. *Art and the Moving Image: A Critical Reader*. London: Tate Pub., 2008. Print.

Manovich, Lev. *The Language of New Media*. Cambridge, MA: MIT, 2002. Print.

Marks, Laura U. *The Skin of the Film: Intercultural Cinema, Embodiment, and the Senses*. Durham: Duke UP, 2000. Print.

McAfee, Noëlle. *Julia Kristeva*. New York: Routledge, 2004. Print.

Mulvey, Laura. *Death 24x a Second: Stillness and the Moving Image*. London: Reaktion, 2006. Print.

Parry, Joseph D., ed. *Art and Phenomenology*. London: Routledge, 2011. Print.

Rees, A. L. *A History of Experimental Film and Video: From Canonical Avant-garde to Contemporary British Practice*. London: BFI, 1999. Print.

Rush, Michael. *New Media in Art*. London: Thames & Hudson, 2005. Print.

Sontag, Susan. "The Decay of Cinema." *The New York Times*, 25 Feb. 1996. Web. 29 Jan. 2013.

Steinbrügge, Bettina. "Modes of Curatorial Practices: Moving between art, Cinema, and performance." Keynote Lecture for 'The Shape of Things', the Symposium of 4th Auckland Triennial, 22 May 2010. N.p., n.d. Web. 20 Feb. 2013.

Tribe, Mark, and Reena Jana. *New Media Art*. Köln: Taschen, 2006. Print.

Uroskie, Andrew V. *Between the Black Box and the White Cube: Expanded Cinema and Postwar Art*. Chicago and London:University of Chicago Press, 2014. Print.

van Brake, Marcell, Eikelboom, Wander, and Duerinck, Frederik. *Sense of Smell, The Eriskay Connection*, 2014. Print.

Williams, Linda, ed. *Viewing Positions: Ways of Seeing Film*. New Brunswick, NJ: Rutgers UP, 1995. Print.