Exposing Layers

A Behind-the-Scrim look at Choreography in Mixed Reality Environments

by

Katie Phelan

A thesis submitted in partial fulfillment
of the requirements for the Master of Fine Arts
degree in Dance in the
Graduate College of
The University of Iowa

May 2022

Thesis Committee:
Daniel Fine, Thesis Supervisor
Stephanie Miracle
Eloy Barragan

ACKNOWLEDGMENTS

This project is generously supported with equipment from the University of Iowa Department of Dance, Public Digital Arts, and Daniel Fine.

With Gratitude

To my dancers who have become my collaborators and friends. Thank you for going on this wild ride with me. I am thankful for each of you and your unique contributions to this process.

To my committee, thank you for holding space for my growth in this process and for pushing my inquiry beyond my prediction. To my Thesis Committee Chair, Dan Fine, my sincerest gratitude for your support, mentorship, and contribution in my graduate research.

To my parents and siblings, I am deeply grateful for your ongoing love and support in me as a person and as an artist. To Will, you have supported my dreams at every turn. Thank you for always believing in me, and more importantly, thank you for your constant love and support in all that I do.

ABSTRACT

My thesis work is a performance that uses a live camera to capture dance on a proscenium stage and projects it on a downstage scrim. The audience can see through the scrim's projection to observe dancers and camera movement upstage. Today, internet access has made unveiling digital art techniques a secondary performance through tutorials and "behind-the-scenes" explanations. This work is situated in a constant "behind-the-scenes" point of view. It is a performance of method as well as a performance of the relationship between live action and real-time feedback. It makes the "cause and effect" visible on the stage and scrim, which offers a viewing experience that is different from solely stage performance or cinema. The choreography considers a dialogue between the stage performers and mediated bodies on the scrim to ask how they co-exist. Knowledge of the inscribed dancing body is used to create movements of the camera as an extension of the body. To support my research, I am utilizing a growing archive of sources which currently includes written work by Sita Popat, Douglas Rosenberg, Karen Wood, Kim Vincs, Christine Whyte, Peggy Phelan, Jennifer Nikolai, and bell hooks.

PUBLIC ABSTRACT

My thesis work is a performance that uses a live camera to capture dance on a proscenium stage and projects it on a downstage scrim. The audience can see through the scrim's projection to observe dancers and camera movement upstage. Today, internet access has made unveiling digital art techniques a secondary performance through tutorials and "behind-the-scenes" explanations. This work is situated in a constant "behind-the-scenes" point of view. It is a performance of method as well as a performance of the relationship between live action and real-time feedback. It makes the "cause and effect" visible on the stage and scrim, which offers a viewing experience that is different from solely stage performance or cinema. The choreography considers a dialogue between the stage performers and mediated bodies on the scrim to ask how they co-exist. Knowledge of the inscribed dancing body is used to create movements of the camera as an extension of the body. To support my research, I am utilizing a growing archive of sources which currently includes written work by Sita Popat, Douglas Rosenberg, Karen Wood, Kim Vincs, Christine Whyte, Peggy Phelan, Jennifer Nikolai, and bell hooks.

DOI: https://doi.org/10.25820/sxws-6r32

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

INTRODUCTION

As a Master of Fine Arts candidate in the Department of Dance on the choreography track, my primary research in graduate school has been within choreography of screendance; the intersection of dance and film. Through my research, I consider the choreography of dancers' physical bodies in relation to the choreography of the moving camera. As an extension from screendance, my thesis centers on a mixed reality environment in Space Place Theatre which uses live dancers, a live camera, and projection in one live performance.

The performance transcends physical bodies into digital space via the live camera that is projection onto a white scrim - a projectable, yet transparent piece of fabric - that hangs downstage of the live dancers, between the audience and performers. Due to the scrim's transparency, the audience can see upstage of the scrim to observe the choreography of the camera and behind-the-scenes elements happening in physical space. My choreographic choices considered the visibility of operating action as a performance to the audience; not just what happens inside the camera's frame, which is traditionally the only thing visible to a screendance viewing audience. This work creates dimensional multiplicity by considering the relationship that forms between the physical dimension, of bodies on the stage, and the digital dimension, with the projected live camera on the scrim, through both unveiling choreographies and the technology of real-time transmission.

My piece and process have been supported, questioned, and transformed by the theories of "Kinesthetic Empathy: Conditions for Viewing," by Karen Wood; "Virtualizing Dance" by Kim Vincs; "Transcending Dimension," by Sita Popat; "Selective Histories: Moving Image from the Late Nineteenth Century to the Early Twenty-First" by Christine Whyte; "Telepresence Art," by Eduardo Kac; and "Resurrecting the Future," by Ann Cooper Albright.

My thesis committee members, Professor Daniel Fine, Professor Stephanie Miracle, and Professor Eloy Barragan have impacted this process through their advice, questioning, and support. Their observations have brought attention to unconsidered aspects in the work like performativity, humanity, and purpose. Their advisement afforded me the opportunity to define what I find important in the work. They have served as the voice of validation and held space for my growth in this process.

TERMINOLOGY

For the duration of this paper, I will use specific terminology to communicate the complex concepts of technology, space, and body in this work. Following in the footsteps of Sita Popat, I will use the term *dimension* as an articulation of space or place where events of this work occur (Popat, 2016). I will use the terms *physical dimension and physical space* when referring to the space occupied by living beings in "real, geographical, measurable space" (McHose and Godard, 2006, 33). I will use *digital dimension* and *digital space* to refer to the mediated space where the live camera's video becomes projection on the scrim. I will use the term *mixed reality environment*, as Popat defines, to refer to the quality of the work that stretches and collaborates between the physical and digital dimensions (Popat, 2016). I will use the term *camera operator* as an assigned role to the human who causes the camera's movement. I will use *dancers in the frame* to describe the performers who are visible in physical dimension as subjects of the camera's gaze. I will use the term *mediated bodies* when referring to the image of the dancers in the frame projected on the scrim. I will refer to the performers of this piece as dancers, camera operators and stagehands. Sometimes, I will refer to them as a collective, as well as by their individual names: Kara Bouck, Ellie Daley, Kendra McDaniel, Zoe Miller, Ellen Oliver, Kaitlyn Rogers, and Emily

Trapnell. I will refer to Emily Berkheimer, who acts as a performer, as stagehand and/or projection coordinator. Lastly, I will refer to the sections of the piece by name to articulate specific examples of how my process determined the outcome of the work. Below is a table (Table 0.1) with the name of each section in chronological order and a brief description.

Pre-Show	The dancers take the stage to perform their set-up labors. The scrim is drawn, and the focus grid animation plays.
Introduction	The three quote videos play while the dancers perform their name movement upstage of the scrim. The camera rolls downstage on a skateboard pulled by Bouck.
Surfing	The dancers lay on their backs and move a board across the stage holding the camera.
Wave	Trapnell makes a wave-like motion with her arm downstage of the scrim as the upstage dancers move in a wave-like canon.
Dragging/ Miller's Solo	Bouck operates the camera as she is dragged upstage of the scrim. Miller performs a solo movement phrase downstage of the scrim.
Bouck & Miller Duet	Bouck, operating the camera, and Miller, in the camera's frame, tilt and shift in tandem with each other just upstage of the scrim.
Catching	Bouck operates the camera and attempts to 'catch' the movement of three dancers on stage.
Framed	Two dancers draw a frame on a white board as three dancers perform a movement score in the negative space of the drawn frame's projection.
Rotisserie	Collectively, the dancers rotate Trapnell, operating the camera, and Oliver, in the camera's frame, in tandem.
Circle	McDaniel creates a circle frame with her arms while Rogers operates the camera's focus through McDaniel's arm circle. The additional dancers form a circle on the floor and 'pass' movement around the circle which is followed by the camera.
Whip Pan	Oliver operates the camera, alternating whip pans between Rogers and Daley.
Tumbleweed	The collective slowly rolls downstage as Oliver, operating the camera, rolls the camera frame with them.
4th Wall	The dancers press on, descend under, and emerge on the downstage side of the scrim.

Biped	The dancers move from a diagonal line to a vertical line as the camera, operated by Miller, faces the back of the scrim.
Bouck's Solo	Daley, operating the camera, points the camera downstage at the scrim in a light blackout. Bouck performs a movement score between the scrim and camera as she is backlit by the projector's light.
Mirror in a Mirror	Daley, operating the camera, faces the camera downstage at the scrim in a light blackout. The dancers perform a cannoned movement score to increase the multiplicity of mediated bodies.
Bouck's Reprise	Bouck's solo returns with minimal stage lights added.
Chaos	Full stage lights return as choreography of the work is reprised all at once. The three quote animations return in sections.
Ending	After the video signal cuts out, the dancers descend under the scrim without the camera. They enter their color bar and shed their costume's color layer as the animation fades. They perform their name movement as animation reveals their names.
Post-Show	Miller draws the scrim back to reveal the cluttered stage. The dancers clean up the equipment and props as the credits play on the back scrim.

Table 0.1: Section names and descriptions in chronological, performance order.

CHAPTER 1: THEORY & PROCESS

1.1 Unmasking Labors

Through the process of this project, I found my primary interest in the secondary performance of the labor. The unique quality of displaying the projection on a scrim allows the action behind the scrim to be seen throughout the performance. It might be natural for the audience's attention to be drawn to the large, white scrim which displays the moving camera's images. However, my intention was to expose the manipulation of the camera and the behind-the-scenes movement, while amplifying the effect – what the camera sees, projected on the scrim.

To follow in the footsteps of Judson Dance Theatre and many other performances of process, my goal was to "challenge the constructs and traditions of dance by exposing choreographic structures during performance, thus generating performances of process." (Blades and Meehan, 2018, 5). However, unlike some members/a majority of the Judson Dance Theatre, my content of the process is not improvised throughout the work. Many of my choreographic choices were based on the opportunity for an audience member to understand the *how* of an event as a secondary performance. Considering the manipulations of choreography and the effects it had for the spectator, the work is classified as Benford, O'Malley, and Reeves's conception of an expressive interface.

"Expressive interfaces tend towards revealing, even amplifying, both manipulations and effects. For performances, their primary concern is to entertain spectators by enabling them to appreciate how well a performer is interacting with a system." (Benford, O'Malley, Reeves, 2005, 748)

The visibility of how the piece is made in its totality must consider three discrete choreographies, that of bodies, camera operation, and prop manipulation. The process of choreographing these components considers the performative expectation of the dancers while also considering "what it means to 'perform' with an interface in a public setting and explore the challenges of designing the spectator experience." (Benford, O'Malley, Reeves, 2005, 741). For my work, the spectator experience is designed to defamiliarize the audience's expectations in watching either a traditional staged performance or the screening of a filmed work. Constantly throughout the piece, it is asking the audience to be active in their spectatorship and view the manipulations as a performance of process.

1.2 Importance

Currently, in our digitally charged culture, we can absorb digital art products and rapidly follow-up with a tutorial on how to create it. This concept is extremely prevalent on platforms like YouTube and TikTok. With a Google search of "how to" and "Adobe," it is possible to access hundreds of tutorials and behind-the-scenes creation videos. Inside of TikTok culture, there are endless streams of content, followed by the tutorial of how to make it. As Richard Schechner's research in performance studies says, "'To Perform' can be understood in relation to: being, doing, showing doing, [and] explaining 'showing doing'" (Schechner, 2006, 28). Without fully understanding the theory or reasoning behind the creation, the content creators of TikTok are investing in camera operation, framing, editing, musicality, and the choreography of film work. In their first video, they encompass "doing" in their performance. Their tutorial video encompasses "showing doing" through their examples of recreation. Their tutorial videos become a secondary performance which is planned, choreographed, edited, and put on display

for an audience. Potential audience members – those who engage with TikTok directly; those who have access to TikTok by means of smartphones; and those who have access to TikTok content through sharing on secondary social media outlets like Instagram, Twitter, and Facebook - can observe these performances in back-to-back viewings.

With knowledge of this social movement at the forefront of our mind, why is it valuable to unmask the labors behind my work? In My work employs bell hooks's conception of theory as a liberatory practice, taking inspiration from the statement that "theory emerges from the concrete, from my efforts to make sense of everyday life experiences, from my efforts to critically intervene in my life and the lives of others" (hooks, 1991, 8). When people ask me about my work, I frequently unpack the process that resulted in the outcome. I am excited to share how it was made or how I conceived of it. So, given an option to mask the labor or reveal it in the performance, I echo Susan Leigh Foster: "Why ignore or suppress this labor?" (Foster, 2011, 2). Her idea revolves around the labor of creating the dancer and creating the choreography. In terms of my own work, there is importance in naming and displaying the labor of the work: the dancing bodies; installing and uninstalling equipment; and learning new techniques and technologies.

1.3 Curating the Labor

Careful sculpting and curating went into the choreographed sequencing of labor to offer the audience an insight to the performance of process. "Staged performances often involve an element of orchestration, meaning a set of activities that are oriented towards the smooth running of the experience." (Benford, O'Malley, Reeves, 2005, 748). I brought the following examples of

behind-the-scenes choreography into my process as possibilities for how to orchestrate my acts of labor.

TikTok User, @Darius_Twin creates behind-the-scenes videos which demonstrate his creation process of light painting. In these videos, viewers witness the movement of his body as he articulates the lines and curves with a light that will be documented as a still image through long-exposure photography. His movements are pre-determined, choreographed, and executed to create the produced image. At the end of each video, he displays the image as an outcome of his process. Entertainment group, @wolfentertainments, has a viral video, *Behind the Camera #ChicagoPD*, where viewers can watch behind-the-scenes footage paired with the scene's produced footage. The choreography of this scene can be noted in the movement of the camera; body placements in the frame; entrances and exits in and out of the frame; and the actors' movement behind the camera to remain out of frame. Both examples above offer the spectator a look into the creation of a product through curated acts. They involve orchestration and implementation of those activities to achieve the outcome of the product. These examples served as inspiration to implement orchestrated acts as a choreographic element in the work.

These orchestrated acts begin during pre-show with the construction of the stage and technology equipment. During this period, the dancers are performing acts of construction by stringing the Serial Digital Interface (SDI) cable, which carries the video signal, across the stage and plugging it into the camera; pulling the scrim across the stage and securing the tie lines; and more. Each act of construction reveals one of the many labors that must be complete for the stage and equipment to be ready to perform. The theme is carried over from our rehearsal procedures where it was necessary for me to delegate set-up and tear-down tasks to the dancers. By

delegating rehearsal set-up and tear-down procedures to the dancers, we could spend more time using the equipment to research than installing the research equipment.

The acts of construction occur during the opening of the house to situate the audience in a particular viewership. In a traditional proscenium theatre show, there is a period between the opening of the house, which cues the audience to enter the theatre, to the lights fading, which cues the audience to the start of the show. During this period, audience members may engage in conversation, read program notes, and observe the environment of the performance space. These activities all lead to the development of expectations and assumptions for the spectators' perceptions of the work to come. When offered the opportunity to see something unexpected - such as crew members setting up the stage - the audience might ask why this is happening *now*. Layering the acts of labors with the opening of the house situates the audience with an inquiry surrounding these acts of labor. My intention is for the audience to receive those labors as part of the performance as the piece continues and more labors are performing. If the audience notices a white shirt lying downstage of the scrim, they might assume a mistake has occurred. Through the process of work, such assumption will be met with explanation when it is revealed that the shirt's location was intentional for the success of a costume transition.

Similarly, at the end of the work, the work lights upstage of the scrim come on to reveal a stage cluttered with props, costumes, and equipment. The clutter is representational of the labors and acts which had occurred throughout this piece. The performers clean the stage of the requisite clutter as credits scroll on the rear, black scrim. Layering credits over these actions is inspired by the showing of credits after a screendance. In an earlier iteration, I displayed the credits on the white scrim and the credits became the focal point of that moment. The choice to have the credits on the back scrim allowed the finals acts of labor in post-show to be viewed.

While I wondered what the audiences' reaction might be to the credits, I observed the audience wait to clap until the dancer took the stage for their final bow.

During the performances, I observed distinct audience reactions to the performative acts of labor, some of which I had predicted might happen, while other reactions surprised me. As the dancer began preparing the stage in pre-show, the audience continued to mingle as I had hoped they would. I was surprised to observe the audiences' chatter diminish when the scrim was pulled out. I was left wondering if the decrease in stage light became a symbol to the audience of the show starting, like the slow dimming of house lights. The focus grid video became the focal point of the audience at this time which I had not predicted. This focal point resulted in a second unknown outcome: a round of applause when the title of the work shifted into place from the focus grid's letters. I did not expect or predict this outcome, but I was left resonating with the resemblance to moments of applause in a musical opening after the overture is delivered before the actors take the stage. The audiences' excitement and anticipation became apparent as they prepared to watch the show.

1.4 Epigraph

After the title of the work appears on the scrim, three animated quotes are displayed. The primary function of the quotes is to guide the viewership of the audience. I intentionally used quotes that would guide the viewer towards noticing the aspects of the work that:

- Use prior knowledge of the spectator
- Name the labor as performative
- Have strong dimensional relationships inside of the mixed reality environment
- Draw connections between spectator and performer

The first of the three quotes comes from Ann Cooper Albright. Her words establish the connection between technology and dance with that of a common knowledge each spectator might have coming into this performance. She states: “Dance techniques and media technologies are not simply about the capacity of the machines (or even the dancer’s body-as-machine); they also concern how we come to know the world.” (Albright, 2016, 716). When Albright’s quote is shown, the intention is to engage the audience’s curiosity to consider how dance and technology might work together in what follows, thus, directing their attention towards those qualities. From this understanding, they can begin to build an assumption of what is to follow based on their prior knowledge histories of dance and media technology.

Second, Sita Popat offers an introduction to naming the different dimensions of performance space in this work. Appearing word by word on the scrim the quote follows: "Mixed reality environments are spaces that allow ‘Physical and digital objects to cohabitate and interact in real time,’ thereby disrupting assumptions of difference or separation.” (Popat, 2016, 657). It is important to situate the audience’s understanding of the physical dimension, where the living, breathing performers occupy, and the digital dimension, where the mediated bodies are presented. By naming the whole performance space as a mixed reality environment, the audience can assume the performance will occupy multiple dimensions synchronously, thus, directing their attention towards relationship between dimensions.

Lastly, Karen Wood focuses on the relationship between performers and spectators using the body. “His statement, ‘what we do with the body,’ offers the consideration that perhaps dance is not just about virtuosic performance but also about how the connection between the spectators and performances is encouraged in general” (Wood, 2016, 250). By broadcasting this statement, I am naming an opportunity for the audience to engage in the performance through

dimensions. My intention is to establish an expectation that this experience will require cognitive laboring from them. This dance is not just a work of art, it is an experience in and through the dimensions.

There is a secondary purpose for displaying the quotes. They are a demonstration of sourcing scholarly research and the labors of bringing that research into the process. The quotes become an epigraph at the beginning of the work and the dance that follows responds to the established theme. Bringing the scholarship into the work as a performance is my method to unmask my investment in this research. By unveiling the research as a performance process, the scholarship is also a performance.

The construction of the set, scholarly quotes, revealed labors as dance, and deconstruction of the set in this piece asks the audience to engage with an active spectatorship. This active spectatorship enacts what Wood terms "defamiliarization," which "compels the viewer to halt the process of habitualization and forces a greater degree of alertness to the otherwise commonplace. The viewer is forced to see regular objects and artifacts from a different vantage point" (Wood, 2016, 250). Throughout the work, I have designed the choreographer to direct the audience's spectatorship to see the labors of the work. The act of leaving costume pieces on the stage or lights turned on brings an alertness to an otherwise masked aspect of performance.

In addition to the revealed labors, the collective construction of the work gives an understanding of collective action. For this set-up to occur, all parties must be involved and effectively playing their roles. The necessity of collective action becomes a reoccurring theme throughout the work in concepts of stage management, prop or equipment management, and camera operation. The largest theme of this was the use of the body as a method to move the

camera in an operational manner. The bodies moved in manners that replaced technology machines and created dance performance from the movement.

1.5 Bodies-as-Machines

As a scholar-practitioner of dance techniques and media technologies, Ann Cooper Albright's theorization of "bodies-as-machine" piqued my curiosity; I wondered how the movement knowledge of my cast of dancers would shape camera movement if they, too, were attuned to thinking of their bodies as a machine. Prior to rehearsals I developed prompts and experiments that would generate movement and spark inquiry through improvisation and tasks-based routines. In rehearsals, we explored how the human body could be used to move the camera in ways that resembled film industry machinery such as dollies, stabilizers, and gimbals. These explorations resulted in three specific themes of camera operation throughout the work. First, a single camera operator who produced movement by and with their own body's resources. Second, a single camera operator whose movement was orchestrated by another person. Third, the camera's movement was a result of collective action.

The first theme is the most straight forward method of moving the camera with a single operator holding the camera and moving their own body. In the beginning stages of the work, this theme was primarily demonstrated with standing postures and walking patterns to move the camera in physical space. Through the process of developing the mechanics of camera operation with the body, it became important for the camera's operation to be more than choreographed; it needed to be danced. I began asking how the operating body could dance while also framing the subject. What happens if the operator's movement becomes a dance that mirrors, mimics, or

duets the subject's movement? Many of these experiments resulted in the camera operator jumping, *chassé*-ing, crawling, and rolling while maintaining the framed subjects.

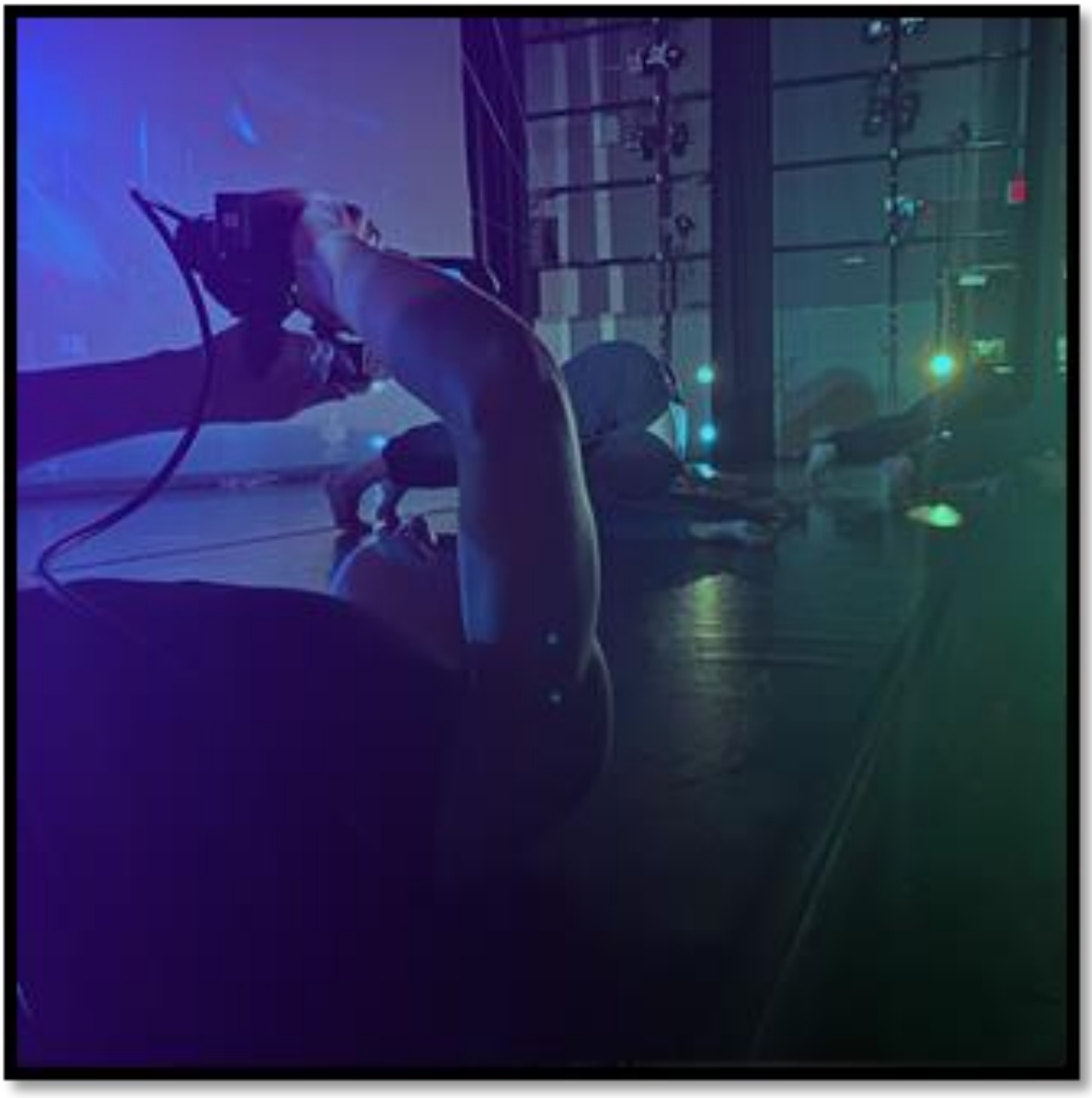

Figure 1.1: Oliver as the camera operator during *Tumbleweed*. Photo view from upstage of the scrim. Photo by Katie Phelan.

In the phrase *Tumbleweed* (Figure 1.1), I asked how the physical body of the operator might roll with the roll of the camera's frame. Secondly, I asked how the subject bodies could roll in tandem with the camera's roll. In this section, Ellen Oliver is rolling laterally on the floor

while holding the camera and framing four rolling dancers. The duetting relationship of the roll was modeled after the filming techniques of iconic film scenes, such as the dream state hotel scene in *Inception* (2010), which have rolling sets and cameras that make the actors appear to walk on the walls and ceiling of rotating rooms. In considering the technique of filming, I was interested in the relationship between the body's rotation and camera's rotation. On a film set, this rotation would be orchestrated by elaborate machines, set design, and technology. In my work, rotation is orchestrated by controlling and sustaining resistance in the human body and muscles. Each person must generate the roll of their body with muscled momentum while simultaneously resisting gravity to slow the roll's descent and stay in tandem with the group. When these elements align, the image projected on the screen is of the camera frame and bodies in the frame simultaneously rolling in unison.

Left: Figure 1.2: McDaniel drags Bouck, operating the camera, across the stage as Daley holds a gold reflector above Bouck. Photo view from upstage of the scrim. Photo by Katie Phelan.

Right: Figure 1.3: In the foreground, Miller and Daley support Oliver's body in a rotating handstand. In the background, Rogers, McDaniel, and Bouck support and rotate Trapnell's body as she operates the camera. Photo view from upstage of the scrim. Photo by Katie Phelan.

The second theme of camera operator's movement is a single camera operator whose movement is orchestrated by another individual's actions on or with the body. Some of the prompts resulted in a single camera operator being manipulated by a single person. For example, in the phrase *Dragging* (Figure 1.2), Kara Bouck lays on her back with the camera facing up while Kendra McDaniel pulls Bouck's feet to drag her body across the stage. Other prompts led to a single camera operator's body being manipulated by multiple individuals. In the phrase *Rotisserie* (Figure 1.3), I returned to the concept of rotating sets and subjects like that of *Tumbleweed*. *Rotisserie* uses a single camera operator, Emily Trapnell, whose movement is orchestrated by multiple people. While Trapnell holds the camera stable to her body, McDaniel, Bouck, and Kaitlyn Rogers rotate her body on the frontal plane, creating a roll movement of the camera. On the other end of the frame, the subject bodies mimic the machine quality of Trapnell, McDaniel, Bouck, and Rogers by rotating Oliver's body 360 degrees over Zoe Miller's back and shoulders with the assistance of Ellie Daley.

Figure 1.4: Dancers lay on their backs with their arms raised. They support and pass the board holding the camera laterally across the stage. Photo view from audience. Photo by Katie Phelan.

In the above example, I can begin to articulate the collective action that is required of three bodies to rotate Trapnell in a cartwheeling action. The rotating actions of both groups of *Rotisserie* were only possible because of the collective action achieved through active participation of each party.

This brings me to the last theme of the camera operator's movement because of collective action. The use of multiple bodies to orchestrate the camera's movement without a primary camera operator can be seen in opening sequence and *Surfing* (Figure 1.4). In the phrase S*urfing*, the choreography is a result of explorations in using the bodies as a machine while the movement of the camera is a requisite of collective action. On a film set, a dolly would be used to stabilize and traverse the camera in lateral space on a set of tracks. In this section, the dancers create the track by laying their bodies down next to one another. Raising their arms in the air, they support the board which holds the camera. The movement of the board requires the dancers to simultaneously receive the board from the person next to them, support the board as it moves, and pass the board to the next person. Multiple hands must support the board at once for it to stay balanced while their hands create a "step-together-step" routine on the bottom of the board. The dancers communicate non-verbally to support and pass the board. Once they have completed their role of supporting and passing the board, each dancer stands and moves to the far end of the line to begin their role again. This creates a continuous line of collective action across the front of the stage. The necessity for multiple hands as support for the camera and board further supports the ideas of collective action as a means for achieving a collective goal. The use of the dancer's bodies as a dolly track is a method to use the body as a machine. The use of visibility in the section offers the audience an opportunity to view the labor of the collective action and see the bodies work together to make a machine.

1.6 Dimensional Multiplicity

The research in this piece investigates the transformation of information from the physical dimension into the digital dimension, a concept Sita Popat refers to as transcending dimension (2016). Using this concept, my work uses technology to collect movement and performance inside the physical dimension and transcend it into mediated movement and performance in the digital dimension. In addition to transcending dimensions, my work considers the relationship between the physical dimension and digital dimension to create an environment of mixed realities. This choreography of the piece seeks to define a movement relationship between physical and digital space to challenge the traditional perceptions of performance, space, and dimension.

Due to the scenic arrangement of the scrim, the dimensions are layered one in front of another. In this arrangement, the scrim is not the final looking point for the spectator. Instead, the spectator may look upon the scrim as well as through and behind it to see the event(s) behind the scrim occur. This see-through window creates a relationship between the movement of physical bodies and the movement of those mediated in the digital dimension.

As a result, choreographic research in dimensional multiplicity needed to be considered in every aspect of the work because all parts of the piece were made visible. As director of this work, I leaned into this responsibility, guided by Chirstine Whyte's quoting of Béla Baláze's perspective of a good director as one who "does not permit the spectator to look at the screen at random. [They] lead our eye inexorably from detail to detail along the line of [their] montage" (Whyte, 2016, 64). In my perspective, the choreography, through the dimensional relationship, directs the spectator's viewership. With examples of phrases *Framed* and *Wave* (Figure 1.5), I

will explain the process of developing the choreography in dimensional multiplicity and how it guides the spectator's eye.

Figure 1.5: Bouck operates the camera while Trapnell performs a waving arm gesture downstage of the scrim. Photo view from audience. Photo by Katie Phelan.

When developing the phrase *Framed,* I began using the dancer's arms in different shapes and combinations to create a variety of frames. This resulted in twenty frames, which we named

in preparation for our next step. Using a close-up camera shot, three dancers create a rectangular frame with their arms. In the final iteration, the limbs of the dancer were removed, and a white board was added. The performers draw edges of a frame onto the board. The choice to use the whiteboard was made to offer clearer framing of the bodies on stage to the audience. The drawn frame is projected on the scrim with the negative space in the middle appearing white. By way of the camera and projection, the drawn frame in the physical dimension is transcending into the digital dimension. The actions of dancers and camera can be seen in the upstage right corner, but the prominent focus of the audience is the mediated, drawn frame on the scrim. Understanding that "film can allow the spectator to look more closely at the movement, permitting a more detailed and intimate gaze at the action of screen" (Wood, 2016, 247), I played with the space that was behind the scrim to connect the dimensions.

Behind the scrim, the physical dancers are placed in the negative space of the drawn frame while they perform a movement score. The movement of the physical bodies pulls the audience's attention through the scrim to note the action behind the scrim. If the audience looks at the big picture, they will notice the physical bodies are being framed by the mediated, drawn frame. In addition to the dimensional relationship, the movement inside of the drawn frame is curated from the frame of arms in the original design. From the original twenty shapes, the dancers generated individual movements that were compiled into a phrase. When the dimensions are layered, the movement inside the drawn frame is a distinct correlation to the original frame of arms. In this way, the multiplicity of dimensions stretches beyond the dimensional relationship alone and into the specific movement curation.

In the phrase *Wave*, dancers in physical space are placed in a lateral line behind the scrim. Their movement phrase involved dropping, rolling, sliding, jumping, etc. in vertical space. The

phrase begins with a slow canon which progressively becomes quicker with repetition. As a collective unit, their bodies create a wave in vertical space across the stage. Layered on top of this is the projection of Trapnell's arm which mimics the wave's motion. Trapnell, and Bouck holding the camera, can be seen downstage of the scrim. Similar to *Framed*, the prominent focus of the audience is on Trapnell's mediated arm on the scrim. However, movement of physical bodies pulls the viewer's attention beyond the surface of the scrim. The dimensions are drawn together as the wave-like motion of the physical bodies and mediated arm duet in one mixed reality environment. The dimensional multiplicity asks the spectator's gaze to see and understand the dimensions as one, not shifting between seeing events happening in physical space or seeing them in the digital dimension.

1.7 The "4th Wall"

The scrim creates a barrier in physical space between the audience and dancers. Eduardo Kac speaks of technologies, like the telephone, as a source of distancing, rather than one of connections, for which was its original purpose.

> "More and more the phenomenon that used to be thought of as "direct" experience becomes mediated experience without us really noticing it. In its private sensorial experience, it can be seen as the epiphenomenon of a society that chooses to remove itself from public space." (Kac, 1993, 4).

Through mediation, we become more distant from one another. I see the same happening in the arrangement of my set design. Some of the most exciting moments are when dancers enter the downstage space in front of the scrim. These are moments when the dancers break through the barrier and become bodies unmasked by physical material. It displays the same notion of human connectivity as performances that break the 4th wall and engage with audience members.

Figure 1.6: The dancers move under the scrim and emerge downstage of the scrim in their color bar projection. Photo view from audience. Photo by Miranda Meyer.

While much of the piece is about dimensional relationships, I have secondary metaphors planted in phrases. “The physical and virtual dancers appear to perform through the dimensions of the stage space, maintaining a mix reality for the audience where the screen is invisible, and even perhaps aesthetically irrelevant, but nevertheless deeply significant in its impact of spatial narrative." (Popat, 2016, 660). In the instance of *Surfing*, Miller, who is behind the scrim, holds the responsibility of tracking her body and movement to stay within the camera’s frame. It plays on an idea of Miller being caught by the camera’s frame. She is the only one in the frame and her mediated body casts a large image on the scrim. Later, Miller travels downstage of the scrim to have the camera frame her without veiling the scrim between. Instead, she is caught in a

repetitious solo phrase as the feedback of the camera, which is now upstage of the scrim, is projected directly onto her body. In these two sections, I am wondering about our use of modern-day technology to broadcast ourselves while remaining constantly veiled through social media. This is represented by Miller's veiled body behind the scrim as her mediated body looms overhead. When attempting to represent the realness of ourselves through videos and photos, do we even really drop the veil? Miller's physical body becomes caught again when she is downstage of the scrim. The projection lands on her physical body, making her clothing, skin, and movement the surface for digital dimension to become visible. Even though her body is no longer veiled by the scrim in physical space, it is veiled by the digital dimension. So, I wonder, are we still caught in a layer of mediation?

"The equidistance we share is felt as a media phenomenon, if such a distinction can be made, because the process of intermediation of real space promoted by real-time telecommunication apparatuses. The subordination of three-dimensional bodily space to real time is a process of abstraction that continuously blurs the distinction between images and reality." (Kac, 1993, 8).

Towards the end of the piece, the camera feedback cuts out with the signal lost error message. Leaving the camera behind the scrim, the dancers break through the barrier for a final time to enter their color of the error message. (Figure 1.6). There is a phrase, in the introduction, where the dancers were prompted to physically draw their names into space. I curated an alphabet font and taught the movements which orchestrated each letter. The dancers took that knowledge and formed their own names by sequencing the lettering movements together. This phrase is present in the opening diagonal line and serves as both an introduction to the spectator and as method to inscribe their beings into physical space. At the end of the work, the phrase

returns downstage of the scrim. Simultaneously, their names are animated onto the scrim as a final metaphor for their inscription on this work, the process, the stage, and the scrim. In the last moments of the piece, Miller draws the scrim back as a final act of deconstructing the piece and the audience witnesses the depth of the space.

CHAPTER 2: METHODOLOGY

2.1 Single Take

I began my research process with a primary focus in investigations of the camera's movement from one phrase to another. This transitional choreographic development was continuing research from my Spring 2021 independent project, *Continuum*, which considered the choreography of the camera to establish a single-take and perfect loop film. In my previous research, I discovered the importance of camera framing, subject matter inside of the frame, and identifying why the camera is moving. By utilizing the lessons learned in that process, I could establish a point of entry into choregraphing the camera's continuous movement in my thesis research.

I situated myself inside of my thesis work as a performer and main camera operator in the first months of rehearsals. Repeating *Continuum*'s process, I mapped choreography through my unique dual knowledge of both the body and the camera. The modes of my choice making expanded through the acculturation of my body and resulted in my unique choreographies of the camera. As a choreographer, I noticed my experience inside of the piece as a performer was not allowing the work to expand beyond my own experience. My focus was on the knowledge of the choreographic tasks I was producing instead of looking at the work as a whole. I could not see the big picture until I watched the archived documentation of it. My thesis committee's perspective outside of the work inspired me to look at it from the outside as well. When I stepped out of the piece as a performer, I was able to make real-time observations that influenced my inquiry and decisions. In this change, I could see the details of my committee members' inquiries more clearly instead of focusing on my own tasks as a performer. This change in the process also placed a high responsibility on my cast's proximity to the camera in ways that are unlike

traditional dance, or even screendance. Their relationship to the camera shifted from being only a subject of the camera's gaze to also being an instigator of the camera's gaze. They took on interchangeable roles of dancer, camera operator, cord wrangler, and prop manager with sometimes multiple roles at once.

The change in my role as a performer also affected my methodology as a choreographer. Inside of the work, I was prescribing choreography which determined the outcome I wanted to achieve. In a committee meeting, Professor Stephanie Miracle advised I spend more time exploring and discovering before I settle into a determined choreography. This advice led to the process opening to play, improvisation, and explorations which generated the most fruitful discoveries and unplanned choreography. I observed the dancers' understanding of the process shift from receiving and reproducing prescribed choreography to collaborating and articulating their experiences. While I spent much of this time questioning my methodology, I leaned into the scholarship of Pil Hansen, Jennifer Nikolai, and Stephen Nachmanovitch for support.

2.2 Improvisation & Dramaturgy

Focusing my own objectives as a choreographer, projection designer, and dramaturg, I was able to see the larger scope of possibilities in the work. This vantage point offered me the ability to watch events unfold, digest the outcomes, and make choices to modify in real time. I established myself as a dance dramaturg, playing with possibilities and instigating experiments, rather than prescribing choreography to my dancers. I used Pil Hansen's "Performance Generating System" to develop task-based prompts that "systematically set in motion a self-organizing process of dance generation" (Hansen, 2014, 7). I brought the scholarly research of

Karen Wood, Kim Vincs, Douglas Rosenberg, and more into my experiments. Pairing prompts with improvisation, my cast and I began to generate movement phrases that were unplanned and exciting.

Many of the performance generating systems I developed were prompts to generate information from my cast's knowledge sources. With extensive backgrounds in dance, the dancers did not possess the same amount of knowledge in film techniques or videography as they did with dance techniques. This posed a challenge to one of my main goals - to keep the camera as the point of inquiry. In my prior screendance research, I valued the choreography of the camera as an equal component to dance movement in the creation process. I echo Douglas Rosenberg's idea that in screendance narratives "many non-dance points of entry and inquiry, including those from film, video, and visual arts, are lacking" (Rosenberg, 2012, 6). My cast's apprehension and timidness of the camera was part of our process, but with each new exploration, I observed the dancer's confidence grow. Through the process, I saw them develop an understanding of framing, stabilization, motion, and focus. When questions arose in rehearsals, I temporarily stepped into the operator's role to understand what they were seeing, feeling, and how they were responding. I used my dual knowledge of the body and film as a resource to mentor and articulate practical solutions to move forward.

The dancers' knowledge growth soon led to their own curiosities, prompting, and discoveries. The inquiry from the dancer made technology the point of entry. Through these experiments, the "camera-dancer became an observer, a participant, a partner, and an instigator," (Nikolai, 2016, 137), by way of the dancer's investment. The idea of bodies replicating machinery movement became avenues for investigation and play. I saw a shift happen in the rehearsal room, where laughter and play were used to dive deeper into ideas that were seen as

non-normative. For example, *surfing* originated with one dancer's body in place of the board and the remainder of the dancers rolling laterally to instigate the traversing motion. We identified and laughed about the absurdness of using seven bodies in a complex manner to move a camera when the same effect could be achieved simply with one person carrying the camera. The freedom to explore and play in our rehearsal space uprooted the "*knowing* how it should be done" and allowed freshness into the process for both myself and the dancers (Nachmanovitch, 1990, 67).

We followed explorations with journaling sessions to document moments of interest. We discussed our findings and tried to identify what was important inside of these moments of interest. I was curious about their experiences in the movement and use of camera operation. I gained insight into their perspectives of the work from their distinct ways of communicating their "genuinely lived-through moments of movement," (Bannerman, 2010, 478). Together, we built an understanding of the relationship between the camera, the body, and the projected mediated body, and recreated themes from this understanding. Working collaboratively, we built phrases and scores that captured our intentionality as a collective unit. Knowing improvisation can never be recreated exactly "because it is ephemeral and cannot be duplicated, retrieved, or captured," (Nachmanovitch, 1990, 23), there were times that I chose to not define the written phrase. The score is left open to improvisation and the dancer's choice making under the umbrella of our collective intention. I continued to witness the dancer's play in these improvised scores as they returned to the phrase's "roots in the playful spirit," (Nachmanovitch, 1990 67).

As I found myself acting as a director and dramaturg more than a choreographer, I returned to many sources of scholarship that had supported and influenced my creative practice in graduate school. I spent time re-reading the works of Karen Wood, Sita Popat, Ann Cooper

Albright, Douglas Rosenburg, and more. I found new inspiration from previously absorbed knowledge that felt proximal to my practice and history. I invested time watching the works that were analyzed inside of Popat's and Wood's words. Their inquiry gave me perspective on work that was creating mixed reality environments – the very thing I was claiming to create. Merce Cunningham's *Biped* became a resource for visual inquiry and movement generation. My inquiries around Cunningham's *Biped* generated a movement exploration which resulted in my work's section named *Biped*. Through the evolution of my work, my *Biped* would be whittled down to a transitional phrase. However, the observations I made about dimensional multiplicity and the repetition of mediated bodies within those explorations remained themes throughout my work.

2.3 Film Theory

My investment in technology as the point of entry led me to ask what value the living body had as a subject of the camera's gaze. I researched film theory and cinematic techniques as a method to identify how the camera can source human interaction and connectivity. In film technique, a whip pan might be used to create connectivity between two characters. In the example of *La La Land*, "Director Damien Chazelle uses whip pans to create relationships between characters" (Studio Binder, 2021). In reviewing the behind-the-scenes filming process of *La La Land*'s club scene, I noticed several elements of choreography in their use of the whip pan that influenced the choreography in *Whip Pan (Figure 2.1)*. Oliver, as the camera operator in *Whip Pan*, stands stationary but moves her torso and gaze with each whip pan to mimic the motion of *LaLa Land*'s camera operator. Bouck and Trapnell are on either side of Oliver and tap her shoulder to cue the whip as a mimicking gesture of the production assistant's tapping cues.

McDaniel and Miller alternate turning production lights on that backlight the dancer when they are the subject of the camera's gaze. When considering the viewing in physical space, the lights bring exchanging attention to each dancer as the subject of the camera's frame. The lower angle of the light creates a large shadow on the back of the scrim, thus, forming another mediated body. This could be understood as the metaphorical value of each dancer when they are the subject of the frame.

Figure 2.1: Oliver operates the camera after a tapping cue from Bouck in *Whip Pan*. Rogers performs to the camera as McDaniel holds the Dracast light on. Photo view from upstage of the scrim. Photo by Katie Phelan.

2.4 Scrim Installation

My research process shifted when I hung a rehearsal scrim in Halsey Hall's Gym, our rehearsal space for the Spring semester. With the rehearsal scrim, I used a projector to layer the live camera's footage in front of the physical dancers as it would be in Space Place Theatre. This allowed me to research in real time, verses secondarily through post-production editing software

like Adobe Premier Pro. Up until this point, I was projecting the possibilities of the mixed reality environments but never seeing them come together in real time. Observing the layers of dimension and making choices in real time allowed me to modify choreography of body or camera as issues arose.

I began observing my piece from the vantage point of an audience member and invested in how the work would resonate with spectators. My investment into the spectatorship of the work allowed me to see the world I was creating as one unit, not two separate outcomes that happen to be layered on top of one another. My decisions were instigated by the elements of one mixed reality environment and the choreography existed in the space where physical dancers and the digitally mediated dancers occupied together. To echo Sita Popat, "Mixed reality environments are spaces that allow 'Physical and digital objects to cohabitate and interact in real time,' thereby disrupting assumptions of difference or separation," (Popat, 2016, 657). The physical and digital dancing bodies were no longer separate entities once the scrim was installed.

At times, my choreographic decisions were based on the inquiry of how I might make the "physical and virtual spaces of the whole world contained within the proscenium/gauze frame" (Popat, 2016, 662). The camera and live projection transformed one physical body into one mediated body. Together, there were two bodies in space. My choices were influenced by testing the locations of physical bodies on the stage in geographical relation to the mediated bodies on the scrim. I experimented with the size of the mediated bodies by adjusting the proximity of the camera. Adding distance between the physical body and the camera created a smaller mediated body on the scrim. My choices were influenced by the space and its surroundings as certain framing allowed the background of the space to be visible to the audience.

Turning the camera towards the back of the scrim resulted in dimensional multiplicity through optical feedback. “Optical feedback is a classic visual effect that results when an image capture device (a camera) is pointed at a screen that is displaying the camera’s output” (Neal, 2013). When a physical body was placed between the camera and the scrim, the foreground of the frame captured the physical body, while the background of the frame captured the mediated body on scrim. The capturing of the mediated body resulted in a second mediated body, and so on. I relate this effect to looking at a mirror inside a mirror where the images are an ongoing duplication of the first body. While this effect has been used for decades in video arts practices, I was exploring its uses through choreography for the first time in my own practice. I was most interested in the exploration of the relationship between the physical body and the mediated body through choreography. The results of this exploration became prominent in the work, utilized in sections like *Biped* and *Bouck’s Solo*, and grew exponentially when rehearsals moved into Space Place Theatre where we could use the performance scrim and technology to research.

2.5 Technology

With the assistance of my Thesis Committee Chair, Professor Daniel Fine, and fellow graduate student, Michael Landez, I installed the technology equipment for this work into Space Place Theatre. A Sharktooth Scrim - 17'8" by 39'0" wide - for performance, and two Panasonic 5500 lumens laser projectors in the lighting booth. With the projectors stacked one on top of the other, I aligned each projector’s hardware by lens shifting the top lens down and bottom lens up, followed by focusing the two projectors onto the scrim. I installed one 100ft Video Graphics Array (VGA) cable from each projector, through the crevasses of Space Place Theatre’s House, to the media center in House Right. Each VGA cable was plugged into a VGA to Universal

Serial Bus – Type C (USB-C) adapter, which plugged into a MacBook, serving as my media center, where I used Isadora, a projection server software created by Mark Coniglio, as my media server. Once the media center was set up, I used Isadora to converge the two projector images together and map the projection to the specific parameters of the Space Place Theatre proscenium. I used two 5500 lumens projectors to enhance the brightness of the projected image. Once the stage lights were added, the brightness of the image decreased so one projector would not produce a bright enough image.

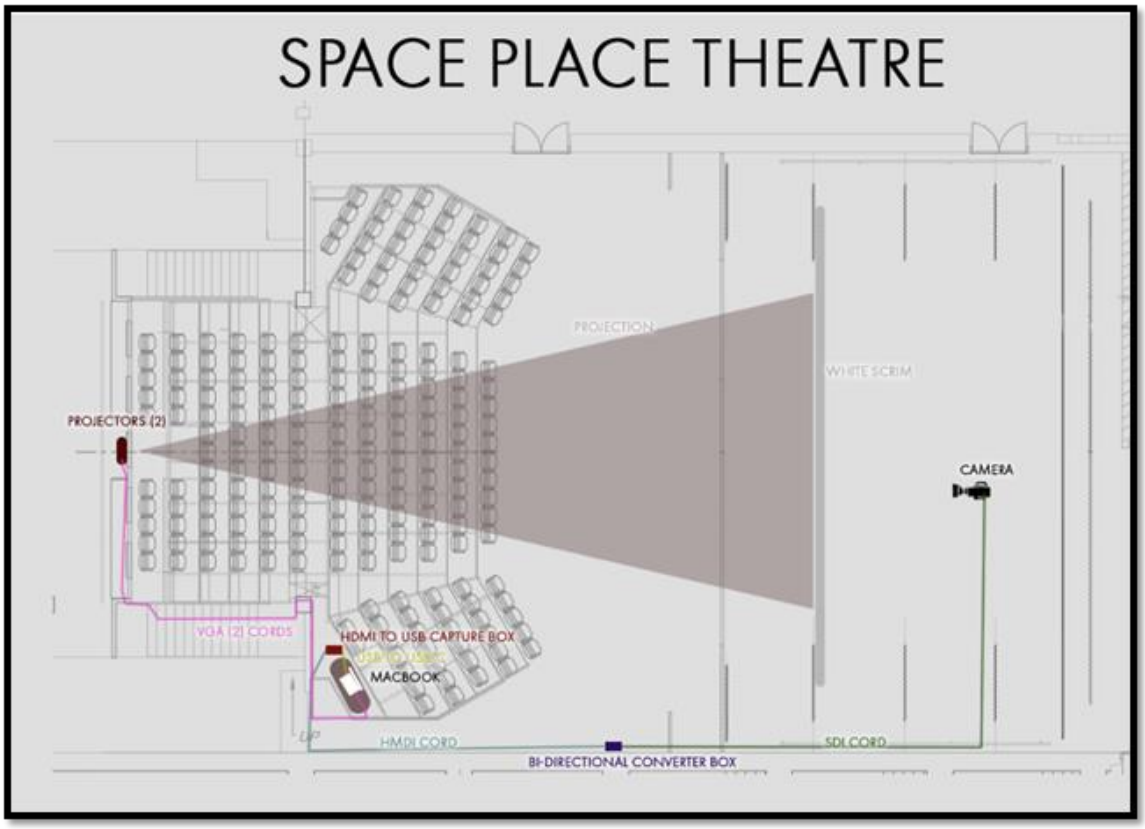

Figure 2.2: A diagram of the layout and technology circuit in Space Place Theatre. Photo by Katie Phelan.

From the stage, I installed a 100ft SDI, leaving enough length for the camera's use on stage, and wrapped the cord around backstage. At the edge of the proscenium, the SDI cord connected to a Bi-Lateral Converter box in House right. Out of the converter box, I connected a 50ft High-Definition Multimedia Interface (HDMI) cable and installed it along the perimeter of

the House. Bringing it to the media center, I connected the HDMI cable to a HDMI to Universal Serial Bus (UBS) converter box. Out of the converter, I plugged the outbound USB into a USB to USB-C adaptor, which plugged the USB-C into the MacBook.

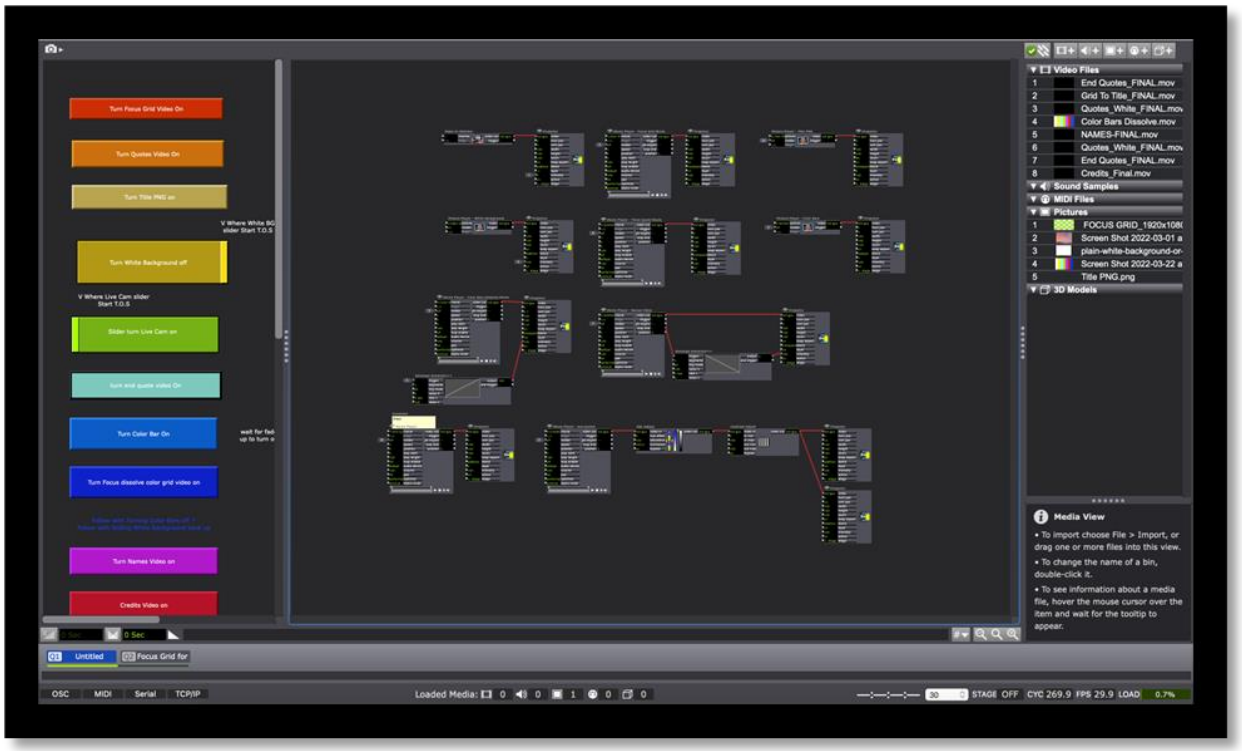

Figure 2.3: The Isadora patch on the MacBook Pro at the Media Center. Photo by Katie Phelan.

I used my knowledge of Isadora software to construct the Isadora patch for the live camera and projection. In the Isadora patch, the feedback from the camera was captured and routed to project back onto the digital stage of Isadora. The videos of animations were installed into the Isadora patch and arranged chronologically by event. The animation videos were exported with transparent, alpha layers to make the live camera feedback visible when the animation was layered on top of it. I used buttons in Isadora to act as triggers for specific animation and blend the visual world of live camera and animated videos. In preparation for Emily Berkheimer to run the Isadora program for the concert, I organized my Isadora patch in chronological order by geographical location in the patch and color. Trigger buttons were

stacked vertically in the order of events and given a chronological color of the rainbow (Figure 2.3) Starting with the red button, Berkheimer was able to descend through the patch to trigger each new event.

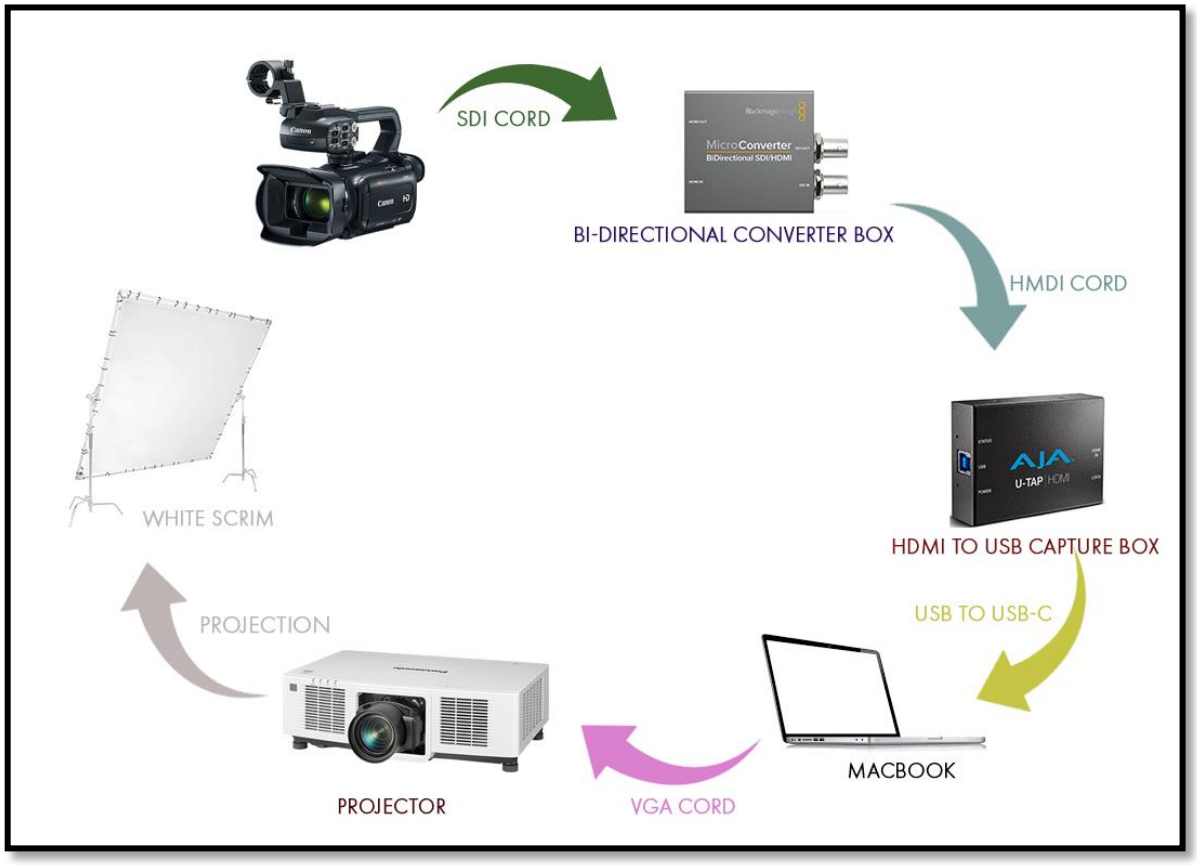

Figure 2.4: A diagram of the technology circuit with equipment and feedback direction. Photo by Katie Phelan.

The labor and choreography of curating the technology elements in this work must be named, for they were as impactful on the process as music or costuming. The creation of the Isadora patch occurred in tandem with the creation of the choreographed movement material and that made the technology construction choreographic. The "choreography is embedded in the technology through the use of editing techniques—a choreography that encompasses and acknowledges its medial components." (Guy, 2016, 594). Prior to rehearsals, I prepared digital materials for exploration in the same manner as I prepared prompts and choreography. In the

real-time of rehearsals, I adjusted qualities of the digital dimension, like video and animation positioning, opacity, size, tempo, and duration in the same way I adjusted the camera's and dancers' choreography. In real-time, we explored the events happening in physical space and the digital dimension and adjusted based on the observations. The choreography I was building was not only in the physical space for moving bodies – it was synchronously built in physical space and in the digital dimension. Every rehearsal, we stepped into a mixed reality environment and began researching there.

Our explorations with technology led me to question what is real-time and what is distance in our mixed reality environment. Inside of the closed technology system, the camera feed traveled through the SDI cord, converted to HDMI at the first converter box, traveled through the HDMI cord, converted to USB at the second converter box, and was captured in Isadora, running on the MacBook. From there, the captured feed was sent to the projector and the light from the projector was caught on the scrim. In physical space, the camera and scrim's projection are, at most, a few feet from each other. However, in a matter of a millisecond, the information travels through the technology circuit in physical space to land where it started. Eduardo Kac says "the shortest distance between two point is no longer a straight line, as it was in the age of locomotive and the telegraph. Today, in the age of satellites and fiberoptics, the shortest distance between two points is real time." (Kac, 1993, 6). To bring this idea into perspective, I can place a dancer next to the scrim with a live camera focused on her. With this technology circuit, it will take more time for her to reach out and touch the scrim than it will take for the image of her hand moving to hit the scrim. If we start the camera's live capture at the same time as her movement starts, her mediated body will arrive and touch the scrim before her physical body. I knew of and could grasp this concept through my understanding of technology.

However, I did not contemplate its vastness until I labored to install the technology and research with it in Space Place Theatre.

2.6 Space Place Theatre

When the piece was able to be rehearsed in Space Place Theatre, I saw the predictions I was making in Halsey become a reality. In a meeting, Fine articulated the thought that we cannot watch the piece as it is in Halsey, but we must visualize the piece we can imagine in Space Place. With the installation of the scrim and projectors, I began to see this imagination come to reality. I saw the scrim as "both the bridge to another place and that which makes vision possible" (Kac, 1993, 10). The ability to research in real-time with the equipment boosted innovative ideas and areas of excitement. The world of this and that, of physical bodies and digital dimension, melted together to form the one mixed reality environment.

I revisited *Bouck's Solo* and *Mirror in a Mirror*, which positioned the camera's frame towards the back of the scrim, with dancers placed in physical space between the camera and scrim. The camera captured the physical body and the technology replicated it as a mediated body on the scrim. Advancing from our exploration in Halsey Hall, the mediated body in Space Place was larger in size on the scrim and brighter in light. This change caused the camera to capture more tiers of mediated bodies which shifted our outcome. As our process leaned into the optical feedback effect, I noted the layers of mediation and canon that was established through the technology's latency. From the camera's perspective, the first-tier mediated body danced behind the physical body with a slight delay. In real time, the image of the first-tier mediated body was captured, replicated, and projected, Bouck's duplicated, mediated bodies create a canon with her physical body as she danced a movement score that shifted her body across the

center line of the stage and camera's frame. The change in size and latency from Halsey Hall to Space Place shifted the choreography of physical bodies to achieve the final outcome.

Figure 2.5: Daley operates the camera in the foreground to capture the multiplicity of dimension and mediated bodies. In the background, Oliver, Miller, and McDaniel execute Mirror in a Mirror. Photo view from upstage of the scrim. Photo by Katie Phelan.

The ability to work in Space Place Theatre also affected the outcomes of technology in the manner of lighting sources. While in Halsey Hall, our rehearsal space was also lit with fading sunlight through the windows or the overhead gyms lights. In Space Place Theatre, I could create a pitch-black space to work. As a result of the dark environment, I discovered the green and

purple light that comes from the projectors when the camera faces downstage. This effect is seen in *Bouck's Solo*, *Biped,* and *Mirror in a Mirror* where the projectors are back lighting the dancers' movement. The effect is caused by the angle of the camera in relation to the Red, Green, and Blue (RGB) light spectrums being produced by the projector. Depending on the angle of the camera, the projectors' light appears purple, green, white, or blue. The choreography of the camera was established to capture the variety in color at specific moments. In *Bouck's Solo,* the frame tilts upward and downward during a moment of stationary movement. The tilt results in shifts between green and purple light while the duplicating projections create a longer canon of mediated bodies.

CHAPTER 3: PRODUCTION ELEMENTS

3.1 Animation

In my original plan of what this work would be, I did not predict I would use animation. In the process, I realized how animation could expose portions of the process and research, while enhancing the visual components of the work. Each animated video involves a system of choreographed choices in its creation process. Since “animation is not the art of drawings that move but, the art of movements that are drawn,” (Thain, 2016, 168), I constructed the movements of the animation as a dance. My philosophy on the animation elements comes from my awareness of motion through my embodied practitioner experience. I used the knowledge source I have of movement in the body to animation motion in the digital dimension.

I created an animated video for the pre-show sequence, which shows two focus grids, a common visual tool used in projection mapping, stretch and shift into alignment. This video is an unmasking of the labors required in installation and everyday equipment checks for the two projectors to align during the piece. Once the two grids align in the video, I animated the letters of the title to shift out of the focus grid's letters. As the image of the focus grids fades away, the title’s letters shift into place to display the work’s title, “Exposing Layers,” on a white background. The display of the title models a traditional movie or television title that is revealed after an introduction and before the show or movie resumes.

At the end of the work, the theme of animated quotes returns but only shows the influential words from each of the quotes. This is a call-back to the epigraph at the beginning of the work. It informs the audience of the knowledge and information they have gathered over the duration of the piece. The piece ends with a retrograde of the opening events. As the projection dissolves, the dancers shed the layer of color and return to fulfill their roles as behind-the-scenes

operators. I animated the credits to appear to scroll vertically on the scrim as the audience watches the dancers clean up the scattered gear behind the scrim. I modeled this animation from the scrolling action of traditional film and movie credits.

3.2 Music Composition

The sound score was created in collaboration with University of Iowa undergraduate student, Jacob Smithburg. Together, we composed the sound score in tandem with the composition of the dance. One objective I had for the sound score was to have the sound be generated using technology. I offered Smithburg endless bits of inspiration from sound generating software using metronomes and tempo altering systems. In the score "3-Layers-Deep," I communicated to Smithburg the layers of mediation that occurred when the live camera faced the back of the scrim. After timing the latency of my technology circuit, we determined the sound score could be created with a 100-Beats per Minute (BPM) tempo. Smithburg created a cannoned score which reflected the first three layers of the multi-tiered mediated bodies in *Bouck's Solo, Mirror in a Mirror,* and *Biped,* at 100-BPM. While the movement was not choreographed to a specific count, the consistent tempo and canon resulted in visual alignment of the mediated bodies with the canon in the sound score.

When the final track was completed, I worked with the dancers to build failsafe adjustments into the choreography for timing purposes. It was determined that they would use audio cues to align the sound score transitions with the transitions between movement sections. If the dancers were early in their timing, they would use reptation in their movement to delay the next transition until the sound score shifted. If they were late, they would use subtraction in their movement score to speed up their transition. On opening night, Miller and Bouck repeated an

additional round of their duet while they waited for the sound score to transition. After rushing during the Thursday show, *Whip Pan* continued for a longer period as the dancers listened for the audio cue to shift into *Tumbleweed*.

The Pre-show sound track involved music that influenced the process in some way. Some of the songs, like *Heat Waves* by Glass Animals and *Feels like Sunshine* by Norman were used in our early rehearsal process to establish a constant musical metronome of 110 Beats Per Minutes (BPM). This tempo was absorbed by Smithburg in his music composition to give the dancers a constant 110 BPM throughout the work. Other songs like *Infinity* by Jaymes Young, *Beggin'* by Måneskin, and *Lay All Your Love On Me* by Abba are songs used in viral TikTok challenges. These viral challenges influenced my process because of the film and editing techniques that are used to create TikTok videos. For example, the challenge center around *Infinity* uses a Ring Light to backlight the subject. This idea can be directly related to choreographed light placement in *Whip Pan*.

3.3 Costume Design

The costume design was created in collaboration with University of Iowa Costume Specialist, Juliana Waechter. Each dancer has three costumes which they change on stage for each specific role they are performing. Their base layer includes black studio pants and either a black tank top or a black long-sleeved shirt. This layer is worn when the dancer is performing a behind-the-scenes role like camera operator, cord wrangler, or moving a prop piece around. Each dancer has a layer of white shorts and a white dress. This layer is worn when a dancer is performing against the scrim as a source of projection, like Miller's downstage solo, or in attempt to blend in with the scrim, like Trapnell in *Wave*. The last layer consists of button-down,

long-sleeved shirts in assorted colors. Each color of their shirts represents one of the colors in the "Signal Lost" (Figure 1.6) error message that appears at the end of the piece. Until the end of the piece, it may not be apparent what the colors represent.

Throughout the piece, the dancers can be seen changing costumes as they transition between roles. When a dancer sheds a layer, the costume pieces are left on the floor of the stage in the location the layer was shed. The act of leaving the costumes scattered is a visual representation of cluttering the stage's space with acts of labor. Part of the choreography considers how the dancers return to the location of a previously shed layer so they can reassemble into their next role. In some cases, the dancer's choreography was changed to an alternative route so they could obtain their costume piece. In other cases, the dancers use collective action to move the costume pieces to a new location. This can be seen in *Surfing*, when Miller compiles several shirts and carries them with her across the stage. Later in the piece, Bouck slides to the floor as she throws Rogers' red shirt into the middle of the circle. This choreography made it possible for Rogers to put her shirt on as she transitioned into *Whip Pan*.

3.4 Lighting Design

The lighting design was created in collaboration with University of Iowa Theatre Lecturer, Jim Albert. One of the largest hurdles in the process was balancing the lighting design with the projection design. Throughout our design process, we noticed that many stage lights would land on or bounce off the scrim and diminish the visibility of the projection. With the opacity of the scrim, I wanted to light the upstage dancers to be visible without losing the quality and visibility of the projection. As a result, the lighting design only uses downstage light when the dancers come downstage of the scrim. Additionally, the lighting does not use high-side light

as this casts a luminescent flare on the scrim. Lastly, the lighting design only utilizes the Light Booms furthest upstage of the scrim because the downstage Light Booms cause too much light interference.

The stage lights were not the only light source in this work. The projectors offer a light source that reaches beyond the scrim and was utilized in choreographic complication of *Biped, Mirror in a Mirror,* and *Bouck's Solo*. Beyond these sections, it must be noted that the light projection light illuminates the dancers through the scrim in certain sections. In the opening *Introduction* phrase, the lighting design has subtle stage lights – only enough that the camera can register the dancing figures. In this section, the dancers can be seen through the scrim with projection light cast onto the bodies.

Lastly, two Dracast Lights were used throughout the piece. These lights are used to unmask a laboring of film work but add to the lighting of the work. They are used to mediate the bodies in *Whip Pan* as the light source creates a large shadow of two dancers on the scrim. One Dracast light is used in *4th Wal*l to create mediated bodies of each dancer as they touch the scrim. When the dancers descend under the scrim and appear downstage, they move stage right to step into the place where their mediated, shadow body was located in physical space.

CHAPTER 4: STUDENT INVOLVEMENT

4.1 Student Selection

As part of this cast, the dancers take on responsibilities of live performer, camera operator, subject of camera, cord wrangler, and more. The dancers were chosen based on my confidence that they could perform these duties. I chose mature movers as well as those that I knew to understand technology, film techniques, or could display and understand camera framing within the audition process. To echo Maya Deren in her 1959 essay *Amateur versus Professional*: "Cameras do not make films; filmmakers make films... The most important part of your equipment is yourself: your mobile body, your imaginative mind, and your freedom to use both" (Nikolai, 2016, 134). I knew I could teach dancers how to hold or move a camera in the same way I could instruct choreographic movement to dancing bodies. However, I needed to know, when I told them what I wanted to see inside of the frame, that they too, would have an eye for it. The heavy investment of collaboration and process has led to the development of the work.

4.2 Communication

One of the largest areas of growth I had was in communication and obtaining a common language to communicate. There were moments when my cast could not understand what I was instructing because they did not know the film technique terminology I was using. I started using terminology and language used in dance and saw them understand my objectives. For example, I offered the camera operator the perspective to think of the point of the frame as the points of our own body's hips and shoulders. Using this example, I told her to keep the frame square to the "front" in the same manner we might think about keeping our hips and shoulders square to the

front. From this explanation, the camera operator was able to adjust her method of movement due to her embodied experience in dance.

Part of the communication was in training the dancers in proper use of the equipment and offering them the chance to learn and grow with it. "If the [dancers] are going to operate the cameras, train them and give them adequate rehearsal time with the equipment" (Oliszewski & Fine, 2018, 125). In addition, part of the communication was in translating what I can imagine and see from my own vantage point. Inside the creation process for *Bouck's Solo*, I defined the camera's choreography with myself as the camera operator. During my time with Bouck, I followed visual instigation to improvise the camera's movements. Watching through the frame as I moved the camera, I received "immediate viewpoints on [my] improvised choices" (Nikolai, 2016, 134) which led to the discovery of the projector light effect. I choreographed the movement of the camera to solidify the positions of the frame and achieve the desired effect. I noted visual cues to re-create the sequence and how I used my body to stabilize and move the camera.

In the following rehearsal, Daley, the camera operator for this phrase, and I sat together behind the camera as Bouck repeatedly performed her solo. I showed Daley the visual cues I had established so she could understand what I see, and what I wanted, in this phrase. I explained to her how my hands and arms moved the camera. Some notes were specific details like how lightly my thumb pressed the zoom button so it would gently zoom in and out. Other notes were broad, like how many vertical tilts the frame does, which left Daley "opportunities for immediate viewpoint of improvised choices" (Nikolai, 2016, 134) in her camera operation.

4.3 Student Impact

This work has been more than an opportunity for student artists to engage in the building of a dance and digital art performance. Collectively, we have created an environment where each student is an agent of the outcome. I have watched these dancers learn the intricacies of technology in the work and as a result, I have seen how they have developed a new set of choice making and compositional skills surrounding technology. I have witnessed their growth to become dancers who can identify their own body's knowledge as a resource for camera operation and movement. I see the advancement of their skillsets as dancers, live performers, and digital artists.

In a Spring 2021 meeting, at the earliest stage of preparation, Fine mentioned the value I would have as a performer in this work because of my knowledge of film and dance – that finding someone to replace me is like trying to find a unicorn. While this was true for the beginning of the process, I witnessed the dancers' eagerness to learn and absorb the complex ideas I was offering. When I loosened the reigns, they filled the gaps with their inquiry and exploration. Through the process of this work, an army of unicorns has been built and I cannot be prouder of them.

Beyond my witnessing of their growth, they have shared the impact of their experience. Daley has received a summer internship at Hollins University from articulating her experience in this work within her writing sample. Miller has received a work study opportunity at Bates Dance Festival after using material from this work to apply. Smithburg has expressed the joy he feels seeing his music come to life through dance and his interest in continuing composition for dance. As much as I have valued this project for my own research, it brings me the utmost joy to

hear how this work has impacted the artists involved in it. It is a seed that has been planted for their future growth.

CHAPTER 5: CONCLUSION

I began this work with the intention to integrate digital art and live dance in one performance. Through this process, my creative practice has grown to new levels and new dimensions. In the beginning, I was imagining what could be possible inside a mixed reality environment. I was projecting a knowledge of mixed realities and dimensional multiplicity because I understood these concepts when I read the scholarship about them. As the piece closed, I reflected on the growth within my understanding; I had obtained the knowledge of a detailed architecture inside my mixed reality environment. The development through process encouraged my curiosities residing within the walls of the architecture. Beyond the mixed reality environment, I invested in my excitement to reveal the mechanism through which the various effects emerged. The process allowed me to explore how I might direct the audience's viewership towards the manipulations as much as the effects.

As I continue work in the digital arts and dance fields, the knowledge I have gained is informing my practices and preparing me to continue research in mixed reality environments, screendance, and digital arts in my future. Through this experience, I have gained knowledge in the technological use of live cameras and projections. Working with cameras in this way has informed my practices in screendance and choreography. I see the methodology of screendance creation as integrated construction instead of dance choreography documented by the camera's frame. Working with live performance and projection has led me to wonder about incorporating my animation work into the mix. I am beginning to ask how a similar relationship can develop between animation and dance choreography inside of the mixed reality environment. I see how I might create this work through pre-visualization and rehearsed dance movement with a similar technology system.

Working with the dancers has informed my practices as a mentor and instructor of digital arts and dance. In this work's timeline, I observed the dancers' skills of camera operation and framing grow through months of learning. At the same time, I learned ways to communicate and teach to an array of learners and skill levels. This experience made me aware of the learning curve that participants must go through if they enter my research process without my same background. Such an awareness has instilled empathy and patience in my working method to offer space for learning and growth. While I cannot predict the knowledge level of every dancer I will encounter in my future, I can say the tools, empathy, and support I have gathered as a mentor from this experience will be utilized in all my future endeavors.

As I exit this experience, I feel energized and excited to expand upon this work; expand the accessibility of this work; and begin the next big project. I reflect on the months of labor, hours of research, weeks of confusion, and the few days of showing the work to feel humbled and grateful for every moment of it. It has been incomparably beneficial to invest wholeheartedly in one work and watch it grow over time. By the week of the show, the work had outgrown me. As a choreographer there is a point when the work is no longer your own. It belongs to the performers - For them to embody, experience, and enjoy. It has been the most beautiful experience to watch this cast and crew collectively own this work.

WORKS CONSULTED

Albright, Ann Cooper. "Resurrecting the Future." *The Oxford Handbook of Screendance Studies.* Oxford University Press, (2016).

Bannerman, Henrietta. "Choreographers' Reflexive Writing – A Very Special Practice." *Forum for Modern Language Studies*, 46.4 (2010). 474-87.

Benford, Steve, Fraser, Mike, O'Malley, Claire, and Reeves, Stuart. "Designing the Spectator Experience." *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems,* ACM, (2005). 741–50.

Blades, Hetty and Meehan, Emma. "Performing Process Sharing Dance and Choreographic Practice." *Performing Process Sharing Dance and Choreographic Practice*, Bristol: Intellect: United Kingdom, (2018).

Foster, Susan Leigh. "Introduction." *Worlding Dance,* Edited by Susan Leigh Foster. Basingstoke: Palgrave Macmillan, (2009).

Guy, Priscilla. "Where Is the Choreography? Who Is the Choreographer?" *The Oxford Handbook of Screendance Studies*, 1st ed. Oxford University Press, (2016).

Hansen, Pil. "Dancing Performance Generating Systems." *Theatre Topics*, 24.3 (2014). 255-60.

hooks, bell. "Theory as Liberatory Practice." *Yale Journal of Law and Feminism*, (1991).

Kac, Eduardo. "Teleskulptur", *Kulturdata*, Edited by Richard Kriesche, (1993). 48-72.

McHose, Caryn. "Phenomenological Space – An Interview with Hubert Godard." *Resources in Movement.* (September 2006).

Meduri, Avanthi. *Worlding Dance*, Edited by Susan Leigh Foster. 2009. Basingstoke, UK: Palgrave Macmillan. 209 Pp., Cover Illustration, Notes, Works Cited, Index. £50.00 Cloth." Dance Research Journal 43, no. 2 (2011): 109–12.

Nachmanovitch, Stephen. *Free Play: Improvisation in Life and Art.* 1st ed., J.P. Tarcher: Los Angeles, (1990).

Neal, B., & Laser. "The biggest optical feedback loop in the World (Revisited)." *BlairNeal.com*, (July 7, 2013).

Nikolai, Jennifer R A. "The Camera-Dancer: A Dyadic Approach to Improvisation." *The International Journal of Screendance,* (2016). 131.

Popat, Sita. "Transcending Dimensions." *The Oxford Handbook of Screendance Studies,* 1st ed., Oxford University Press: United Kingdom, (2016).

Oliszewski, Alex, Fine, Daniel, and Roth, Daniel. *Digital Media, Projection Design & Technology for Theatre.* 1st ed., Milton: Routledge, (2018).

Rosenberg, Douglas. *Screendance: Inscribing the Ephemeral Image.* Oxford University Press: New York, (2012).

Schechner, Richard. *Performance Studies: an Introduction.* 2nd ed. Routledge: New York, (2006).

Thain, Alanna. "In the Blink of an Eye." *The Oxford Handbook of Screendance Studies,* 1st ed. Oxford University Press, (2016).

@Darius_Twin. "Light Painting." TikTok, uploaded by Darius Twin, 25 Aug. 2021, www.tiktok.com/@darius_twin/video/7000414738781883653?_t=8QsrL3cR8LG&_r=1..

"Ultimate Guide to Camera Movement — Every Camera Movement Technique Explained [The Shot List Ep6]." YouTube, uploaded by Studio Binder, 5 Oct. 2020, www.youtube.com/watch?v=IiyBo-qLDeM&t=266s.

Vincs, Kim. "Virtualizing Dance." *The Oxford Handbook of Screendance Studies*, 1st ed. Oxford University Press, (2016).

Whyte, Chirstinn. "Selective Histories." *The Oxford Handbook of Screendance Studies*, 1st ed. Oxford University Press, (2016).

@Wolfentertainment. "Behind the Camera." TikTok, uploaded by Wolf Entertainment, 22 Mar. 2021, www.tiktok.com/@wolfentertainment/video/6942538423706127622?_t=8QsrMUW0ZUU&_r=1.

Wood, Karen. "Kinesthetic Empathy." *The Oxford Handbook of Screendance Studies*, 1st ed. Oxford University Press, (2016).