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CMD+FN

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CMD+FN

by

Marc Macaranas

A thesis submitted in partial fulfillment
of the requirements for the
Master of Fine Arts
degree in Dance in the
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Thesis Supervisor: Assistant Professor Daniel Fine

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PUBLIC ABSTRACT

How are digital media content making strategies also choreographic strategies? What might be produced at their convergence, and, when they diverge, how might they continue to run in parallel or intersecting lines?

To answer these questions, I began a creative research process that considers how digital interfaces function as instructions for users and how this interaction imposes a choreographic logic and workflow for making dances. At play in the process were four key propositions: first, that particular economies of labor could be revealed in the making of a work; second, that choreography and the dancing body can serve as means to explicate the function of digital interfaces; third, that strategies for making digital media content are choreographic strategies; fourth, and perhaps most important, that the dancing body and the digital media with which it interacts register equally in the scope of the work.

The creative research built on these propositions resulted in *Cmd+Fn*, a site specific, live dance and digital media performance in the Media Theater of Art Building West. Featuring a cast of 10 dancers, an interactive media system that transforms the performance space into an immersive video environment, dynamic lighting and sound design, and an audience of over 400 people, *Cmd+Fn* challenges its participants to rethink the edges of where choreographer, audience and performer meet.

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INTRODUCTION

My fingers type on QWERTY keyboards with such accuracy and dexterity that I rarely think to look at the keys as I press them — in fact, the speed with which I can type thoughts onto the digital page now surpasses my ability to handwrite with ink and paper. When I use my phone to place a delivery order for dinner, I rarely talk to another live person. Rather, my fingers glide along a familiar pattern on the smooth glass, tracing and tapping a sequence that results in a knock on my door within half an hour. These gestures, small and seemingly insignificant, produce real and measurable results that are due in large part to the medium upon which they act.

These are all functions mediated by digital interfaces. They require a specificity of movement and gesture before a particular result is produced. Not only do these interfaces elicit human gesture and movement, they program onto their users the particular schema and patterns that produce a variety of tangible results. For years, my hands have borne the muscle memory and quick twitch dexterity that commit these words to the page. My fingers likewise know the contour of my phone well enough to pull up the weekly forecast with barely a glance. *As these devices impart and require a movement knowledge, can these digital interfaces be considered choreographic? If so, what might be the implications of recognizing these choreographic objects on my own dance and digital media making practice as a Movement Media Maker?* These were some of the central questions I considered as I began my choreographic research.

In order to address these questions, I needed to address matters of practicality. Before answering how the role digital media might be meaningful to my work, I needed to first understand how to build it. Up until this point in my making practice, my choreographic sensibilities have always been chiefly tied to my knowledge of the body and movement as medium. As a professional dance artist, the scope of my career spanned a width of body-based

disciplines and techniques that informed my choices in choreographic compositions. As a digital content creator, however, my skills and instincts were fledgling at best. Whereas movement generating and phrase making were more readily accessible given my career path, the tools at my disposal for digital content creation, Adobe After Effects and Isadora, were relatively new and underexplored. Like waking up with an additional set of limbs, I had to learn the extent to which my new arms could reach, grasp and manage. Before understanding their usefulness to my choreographic practice, I first had to understand how they functioned. These considerations of practicality called into question how I might find parity between my established practice as a movement maker and my new practice as a media maker. The following questions emerged that provided additional structure and nuance to my research: *Can the human body function to augment a digitally mediated system in the same way that the system augments the body? What is the relationship of both to the space they occupy? And, as my dance aesthetic is markedly more refined than my digital media aesthetic, how can I bridge those sensibilities in a work in which each medium is an equal player?*

To answer these questions, I proposed the creation of *Cmd+Fn* (pronounced “Command Function”), a site-specific, visually immersive live dance and media performance. As an act of creative research, the work was meant to explore how digital media creation strategies function as choreographic strategies, and vice versa. It sought to examine how digital interfaces baked into editing and design software are in themselves choreographic objects that impose a kind of movement and compositional logic that can be translated by the dancing body. At play in the collaborative creation and performance process were a cast of 10 dancers, a rehearsal director, a composer, a lighting designer, and myself serving as director, choreographer, and media and installation designer.

The scope of the project was predicated upon five main objectives. First, twelve performances from April 17-20 would be shared by the two casts. Each cast would lead an intimate audience of no more than 40 participants into the Media Theater of Art Building West for a 20-minute interactive performance. The walls and floor of the Media Theater would serve as interactive projection surfaces that house projection design generated from live and pre-recorded footage of the performers' dancing bodies. As the performance would be built around audience agency to travel through the space and opt for unique vantage points, seating would be provided only for audience members who require this particular accommodation.

The choreography performed by both casts would be crafted collaboratively. The initial movement sequences would be generated directly from me and then disseminated, altered and remixed by the dancers themselves. The movement prompts would be inspired by the physical actions and command gestures (swiping, tapping, pinching to zoom, double-clicking, dragging, etc.) that are common to digital interfaces. Once made, each movement phrase would be treated as a *layer* commonly used in an Adobe Premiere Pro or After Effects composition. The layers can be stacked on top of each other, rearranged, blended, reversed, or any number of modes.

Second, the creation and rehearsal process would be documented, archived and shared on Instagram. Each of the dancers would be tasked to create an Instagram account specifically for this project. The main account (IG: @cmd_fn) serves to compile the accounts of their movement research and investigations both inside and out of the rehearsal studio, as well as offer a portal into the making of the project via posts, livestreams and Instagram stories. The dancers and I would designate hashtags to appropriately categorize the work we are doing as well as link our online presence to the broader Instagram community. In addition, during the performances,

audience members will be invited to capture, livestream and share their own experience of *Cmd+Fn* via social media using our hashtags.

Third, the bulk of the projection design content would be sourced directly from the dancers' movements. Footage of the choreography would be shot in front of a green screen so that the background might be removed digitally, leaving only the dancers' moving bodies. This footage will be edited and manipulated in Adobe After Effects to create the projection designs that are integrally tied to the performance of the live dancers in space. Utilizing a network of MacBook Pro laptops and an array of projectors in the space, the projections would be displayed on the walls and the floor of the Media Theater as the dancers and audience travel through it.

Fourth, the projections would be interactive. Part of the choreography of the event would be in creating means of "partnering" between the live dancers and the interactive projections. A portion of my research outside of the studio would be spent in developing and creating patches in Isadora, a media server specifically designed for live performance. Utilizing Xbox Kinect cameras interfacing with Isadora, the motion of the live dancers and the audience would modify the projections and trigger live events in the space.

Fifth, in an effort to provide a true to life experience for the pre-professional dancers in the cast, the *Cmd+Fn* process would be modeled after a professional pick-up company. Led by both the choreographer and the rehearsal director, each work session would begin with a short class or group warmup to prime the dancers for the particular physical demands and generative prompts each rehearsal required.

Because of the interdisciplinarity of my research and the multi-modal performance at its result, my experiments and investigations into making meaningful partnerships of choreography and digital media travel along a series winding, circuitous and interwoven pathways. Each

element of my research, from the analog to the digital, served to bolster and uphold *Cmd+Fn*'s process and performance — even the elements that ultimately went by the wayside. My creation process embodied a series of discreet, though not indistinct, stages. Many of these stages occurred as multiple, parallel lines of inquiry that occasionally converged at odd and beautiful junctures. What follows is an attempt to disseminate those discreet elements and reveal the ways in which they support each other.

DIGITAL INTERVENTION + CHOREOGRAPHIC STRATEGIES

In the weeks prior to my first rehearsal with the dancers, I spent several hours in the studio engaged in a solo practice to help develop and refine the particular movement qualities and aesthetics I would later ask of the performers. Thick and quick, low to the ground, syncopated and suspended — these qualities were bound to much of the movement I generated on my own and laid a foundation for an aesthetic approach that the dancers would eventually weave into their own phrasemaking. This preparatory solo practice and investigation called into question how I approach phrasemaking and movement generation.

Whereas in my improvisation practice I often allow my body to follow pathways of inertial force and energetic direction, I wanted for my choreographic practice inside the *Cmd+Fn* process to be grounded by technological intervention. The simplest way for me to accomplish was to make use of the tool most readily at hand: my iPhone's video function. In each of my solo sessions, I began by filming 3-5 minutes of movement material. At the point of my own physical exhaustion, I immediately reviewed the footage to note the sequences and motifs that most strongly resonated with me as either supportive of my aesthetic values or divergent and unusual. This sequence of generating, capturing and revising lasted several rounds throughout in each of

my research sessions and resulted in a recursive editorial process. With each round, I became more adept at distilling patterns and pathways that would later make their way into the performance.

While the near “instant replay” feature of my solo sessions was inherently valuable to my choreographic research and aided me in discovering the specificity and motifs inside my phrase work, the use of Adobe After Effects and Premiere Pro to edit and manipulate that footage provided equal value in three ways: first, from a practical standpoint, it allowed me to experiment and discover techniques that I would later incorporate into my projection designs; second, editing values linked to scale, duration, and temporal direction revealed opportunities for me to see and redirect my own movement habits; third, I began to recognize the close parallel of working with layered compositions inside After Effects and structuring choreographic composition for an ensemble in the studio. This digital intervention was key to structuring a vital workflow for my research. It opened a pathway to developing a choreographic practice for working with dancing bodies and their digital images.

Once the casting was finalized and the dancers joined me in the studio for the start of our collaborative choreographic process, I began by presenting them with spontaneously generated movement phrases. Informed by my solo research practice, these phrases contained the distilled markers of my aesthetic movement values and were meant not only to introduce the dancers to the ways of moving inside of *Cmd+Fn*, but also to be used as generative seeds for expanded phrase material. These phrases became guidelines for established movement schema inside the world we were building. In essence, this early phrasework acted as a kind of coding language, constituting parameters and syntax for the dancers to call upon as our collaborative process grew in complexity and nuance.

PRIMING THE DANCERS FOR CREATION, REHEARSAL AND PERFORMANCE

The dancers and I tested the bounds of this movement syntax through a practice of group warm-up and improvisation. At the beginning of each rehearsal, especially at the early stages of our creation period together, I would lead a warm-up that prioritized the movement values established in our phrasemaking and my solo practice. These warm-up exercises included isolating planes and joints of the body to press through dense and viscous space. By establishing the space as bearing a particular weight and density, I elicited from the dancers a specific muscular activation to highlight their physicality as movers.

I attempted through some of our improvisational prompts and scores to transmediate my experience of digital media software into a physical practice. Thinking about space in terms of planes and grids, I asked the dancers to consider tracing their pathways and rotating their planes through X, Y and Z-space — this resulted in unusual, off-axis methods of moving, not unlike those elicited by the Forsythe Improvisation Technologies. I also asked the dancers to consider how they might interface with themselves, other dancers in the space, and the architecture of the rehearsal studio. With the texture and density of the space already established as producing a thick physicality, I prompted the dancers to research ways of generating movement through three image-based tasks: Marionette, Magnet, and Microflutter.

Marionette tasks the dancers to first consider an invisible string or wire connecting two analogous body parts. The dancers experimented with maintaining the length of these strings and wires as the movement of their wrists through space dictate the movement of their ankles. As the dancers progressed, the strings are then repositioned at will across the dancers' bodies, inviting more opportunities for generating movement pathways while attending to a conscious effort to maintain relative lengths and distances between joints and planes.

With Magnets, the dancers are prompted to again consider the joints and planes of their bodies but with a markedly different movement task. Rather than maintaining relative length and distance, the dancers are asked to assign magnetic polarities to surfaces of their bodies and the space and architecture around them. This prompts a particular kind of velocity as the surfaces meet each other and the space between them quick contracts — ears to knees, elbows to hips, wrists to the floor, etc. Magnets likewise generates unusual pathways for movement when the surfaces change their polarities. Body parts and plans redirect their trajectories in space, quickly flying away from surfaces of opposite designated polarity.

Microflutter asks the dancers to consider the movement pathways they generate in real time and execute glitches inside of them. Much like a stuttering video or audio feedback, the dancers are asked to create intentional bursts of looping movement. These bursts, performed inside the mode of thick physicality, result in staccato twitches and flutters that disrupt and redirect trajectories.

While these methods of moving are derived from a schema of self-interfacing, or perhaps even *intrafacing*, it was important for me that the dancers also develop a physical system for interfacing with each other and the space. Bearing in mind that our performances would take place in the Media Theater without the usual benefit of sprung floor, we engaged in a practice meant to protect the dancers' bodies and hold fast to the aesthetic considerations we were establishing in the work. Rather than allowing the body to give into gravity and rest into the floor, we experimented with a floor work practice that prioritized pushing out of and away from it, actively engaging muscle chains to provide structure, support, resistance and resilience. In practicing this way, we reinforced the physicality presented in the movement sequences as well as prepared the body for the task of dancing on a hard, unsprung floor.

This means of engaging with the floor likewise informed the dancers bodies as they prepared for partnering. One of the values I attempt to uphold inside my partnering work is a weight sharing ethos. I often use the image of the St. Louis Gateway Arch to illustrate how strategically applied weight shared between two or more bodies supports a structure and a method for moving that could not be accomplished by the individual dancer alone. This means of sharing weight and applying contact would later become important in the fully realized performance of *Cmd+Fn*. The dancers would eventually need to support each other as they walked along the walls of the Media Theater and performed dynamic, group lifts to sweep across the floor and reorient the audience members in the space.

By prioritizing these methods of moving early on in the creation process, I was attempting to prime the dancers for a specific range of aesthetic choices. This bounds of this range would serve to cohere the movement generated both from myself and the dancers to the logic of the world we were creating. As my attempt was to elicit a clear and legible movement style for the entire ensemble to investigate, I hoped that grounding our practice in these interface inspired movement ideas would lay a strong foundation for our collaborative phrase making.

CHOREOGRAPHIC STRATEGIES FOR DIGITAL MEDIA MAKING

Concurrent to my work with the dancers in priming their bodies for the physical and compositional needs of *Cmd+Fn*, I was likewise priming myself for the task of designing projections and programming a media system that would perform alongside the dancers in the Media Theater. Early on in the process, I was drawn to the idea of a media system that could be programmed to capture the movement of the dancers and render live video effects in real-time. My research into this spanned Instagram for examples of finished projects, YouTube for video

tutorials, and GitHub for samples of custom code created by developers across the internet. I spent copious hours and several late nights poring over tutorials, forums and example patches to teach myself generative coding languages. Processing and openFrameworks were the programming languages I settled on — I found several examples of projects that were built on these languages and I was inspired to incorporate those methods into my own work.

While the finished projects produced by these coding languages were often beautiful and exciting, executing them myself proved more difficult than I anticipated. The syntaxes of Processing and openFrameworks often left me confused and frustrated. Whereas my experience with choreography could produce real, tangible results in the moment, programming a circle to move from one side of my computer screen to the other took more time and effort than I could reasonably afford. My skillset as a choreographer and my understanding of movement seemed incongruent with this method of designing motion.

After meeting media artist Matthew Ragan (who also has a background in dance and performance) in Chicago and Iowa City, I was intrigued by his use of TouchDesigner to implement his own creative projects and commissions. TouchDesigner is a powerful, completely customizable media server that is built on the Python programming language. Skilled TouchDesigner programmers can design their own user interfaces to render in real-time exactly the kinds of visual effects and motion graphics I imagined for *Cmd+Fn*. TouchDesigner's interface is node and wire-based. It resembles the visual programming environment found in TroikaTronix's Isadora, the only other media server I am familiar with. This visual familiarity immediately made me feel at ease and prompted me to investigate its features further. But despite the glut of online tutorials available, I found myself just as frustrated at my inability to program simple functions. I was hopeful that attending a multi-day TouchDesigner training

workshop led by Ragan at the Live Design International Conference in Las Vegas would help me overcome these setbacks. The training was indeed useful as it provided me greater understanding of TouchDesigner's features, but what I ultimately learned is that my timeframe was simply too narrow to fully learn and program TouchDesigner in a way that would prove meaningful to my process.

As a solution, I decided that instead of real time video rendered via generative coding, I would create the media with the tools I knew best: Adobe After Effects and Isadora. Adobe After Effects is a design software primarily used for video editing, special effects and motion graphics. Its primary user interface is a timeline upon which multiple layers of video footage can be stacked to form a time-based visual composition. Each layer has a unique set of values that can be modified to affect its behavior and appearance within the composition. Some of these values include position along X and Y axes, size, scale, opacity, and duration.

Isadora is a versatile media server developed originally to facilitate media interactivity in live dance performance. Its user interface is node-based and the software comes pre-populated with lines of code that are visually represented as "actors". These actors have input and output nodes that allow for multiple sets of data to channel through them before being rendered out as video.

While my movement aesthetic for the choreography was apparent from the beginning, landing on a visual aesthetic for the media design was a murkier process. I knew from my experience in attempting creative coding that designing and programming motion graphics from scratch would present a steep learning curve. Rather than fall into the same pattern of frustration, I opted instead to use the motion of the dancers as a source material for developing my design. Using archival footage from rehearsal, I began practicing ways to highlight the pixel movement

present in the videos. I developed compositional workflows that used effects such as Difference Matte, Time Difference, Time Displacement and Echo to separate the non-moving background footage from the dynamic motion of the dancers.

As I experimented with footage and effects, another recursive aspect of *Cmd+Fn*'s process became clear to me. The source footage I was manipulating inside of my After Effects compositions had already undergone a series of transformations and refigurations. The choreography recorded from rehearsal was generated from the process of capturing and distilling my own solo practice before being given to the dancers to learn and remix within a set of established movement parameters. That initial movement invention had returned to me to be reprocessed and re-edited using the tools available within After Effects' interface. Unlike creating choreography on live bodies, however, inside of this digital system I could manipulate the dancers' movements in ways not physically possible. I could warp time, re-size and re-scale the choreography, turn dancers upside down and otherwise render the original movement unrecognizable. In using After Effects to manipulate and re-pattern my own choreography, I found that I was relying on my familiar skills as a choreographer and movement maker to design my digital media compositions. I was making choreographic considerations that addressed time, velocity, symmetry, and the location of bodies on a 2D stage.

It became clear that my projection design aesthetic should be centered entirely on the abstracted and repurposed movement of the dancers. To avoid adding extra steps into my compositional workflows, I scheduled a video shoot with the dancers in front of the green screen in the Media Theater. The purpose for this was two-fold. First, filming in front of a green screen meant that I could digitally remove the background from the dancers' bodies and cleanly render

their silhouettes in my design compositions. Second, it was an opportunity to reveal to the dancers the economies of labor that were being exercised inside our process.

Once the footage was captured and the green background digitally keyed out, I set out on the task of developing my fully realized projection designs. After researching several tutorials for working with silhouettes, I created a series of compositions in which the dancing silhouettes served as a source point for constantly expanding wireframe images. My particular workflow for these compositions began with turning the silhouettes into a mask layer. In After Effects and other digital media making programs, masks are versatile tools that are often used to reveal or conceal areas portions of composition. For my purposes, the mask layer reshapes itself dynamically with the movement of the dancers and creates corresponding keyframes on the timeline. Using a Shape Layer as the base for a Radio Waves effect, I sourced the origin of the waves to the mask layer and experimented with new waves being generated with each frame or having all the waves correspond to the shape of the mask path. I attempted multiple iterations of the silhouette shape. Some appear photorealistic and produce clear lines in the shape of the dancers' bodies. Others produce more rounded shapes, concealing the details of the dancer, but highlighting the direction and velocity of the movement.

In positioning my design scheme around the movement of the dancers, I attempted to illustrate the intrinsic relationship of the dancing body to the digital media and highlight their importance to each other in the work. Investing in this line of research helped to solidify an avenue for me as a Movement Media Maker, but it likewise reified for me the recursivity and reflexivity intrinsic to my process.

DESIGNING DANCING WORKFLOWS

In much the same way that my choreographic sensibilities guided the workflows responsible for my digital media compositions, Adobe After Effects' interface played a significant role in designing the choreographic system at play in Cmd+Fn's process.

In the studio with the dancers, I generated several long movement phrases to serve as the base material for our collaborative choreographic practice. These phrases exemplified the particular vocabularies and movement markers I was interested in presenting through the work and provided shape and definitive contour to our body priming movement investigations. In an After Effects composition, this bank of choreographic source material would be analogous to a bin or folder of raw footage. Each of the phrases bore names that were meaningful for the dancers — *Spider-Man*, *Swat*, *Single Hula*, *Double Hula*, etc. These labels were descriptive of particular gestures inside the sequences and made for easy recall in our collaborative process.

Once the base phrases were established, the dancers and I subjected them to a series of transformations and reiterations. I approached working with the choreographic phrases in a process similar to how I might approach a new After Effects composition. I tasked the dancers to do a series of edits to the phrases, splicing sections into and out of movement sequences as a simple matter of copying and pasting. These new choreographic layers were then “stacked onto the timeline” and turned into duets and trios — each dancer performed their variation of the original in tandem to create a choreographic composition fashioned after a digital media composition. In After Effects, layers of footage that have been edited and manipulated can be ganged together in a “pre-composition”. This pre-comp acts as an encompassing unit that houses all the layers in its hierarchy and distributes new edits and effects across the entire sequence. By approaching our choreographic phrasework as layers and pre-comped units, the dancers and I

were able to create multiple iterations and variations all based on the original forms. The sequences were edited for duration, velocity, position, level in space and rotation along axes. As the dancers became more familiar with these methods of manipulating the choreography, it became easier to direct them in making generative choices in their own phrase making.

DIVIDING AND DELEGATING CHOREOGRAPHIC LABOR AND ROLES

In consideration of the demands of performing 12 shows on an unsprung floor, I deliberately divided the cast of 10 into two casts of 5, a *Cmd* Cast and a *Fn* Cast, to perform the same choreography in alternating shows. This would allow for each role to have at least one cover in the event that a dancer was injured or unable to perform. This precaution provided the structure for an interesting choreographic experiment. In rehearsal one evening I asked the dancers to devise their own solos based on the ways they interact with their own digital devices. Using verbs like *swipe*, *click*, *drag*, etc., they created short sequences that were generated from their own experiences and also informed by the aesthetic forms we were using in rehearsal. Once made, the assigned counterparts from each cast were tasked to teach each other their movement phrases and collaboratively generate a solo that blended their sequences together.

As often happens in rehearsal processes, there were occasional scheduling conflicts that prevented the entire cast of 10 from being present in the studio at the same time. Working with two casts allowed the process to continue more fluidly than if each dancer were responsible for a single role in the piece. The dancers moved seamlessly in and out of each other's roles and helped to teach each other the choreography when dancers came back from illness, injury or scheduling conflicts. This facilitated incredibly productive and generative rehearsals, especially since our process later in the Fall and only met for five hours per week.

A huge component of this ease and facilitation was due in large part to the role Bethany Sullivan played as *Cmd+Fn*'s Rehearsal Director. As Bethany was the only graduate student in the cast and had collaborated with me on another work called *DURA*, she was the ideal person to take on this leadership position inside the process. Together, she and I researched job descriptions for Rehearsal Directors and established a list of primary responsibilities as they related to *Cmd+Fn*. These responsibilities included modeling a nuanced knowledge of the choreography to the cast by delivering notes and coaching the dancers, leading warmup when necessary, leading rehearsals in the event that I might be occupied with implementing media design, and acting as a liaison between the dancers and I when it came to matters of scheduling, rehearsal conflicts, and other announcements. The scope of Bethany's role changed and evolved as the process developed. Her ownership of the Rehearsal Director position and the leadership she modeled for the dancers allowed me more time and space for attending to the creation of the choreography and digital media. We met weekly to create rehearsal agendas, discuss the needs of the cast, go over timelines and logistics, and sort through the copious choreographic material we had generated in order to construct a sequence. In total, Bethany's performance both as a dancer and a leader inside of *Cmd+Fn* helped to deliver an experience as close to a professional company as I could provide for the younger dancers in the cast.

COLLABORATING ACROSS DISCIPLINES: MUSIC + LIGHTS

In addition to the choreography and media design, *Cmd+Fn* required music and lights. To that end, I enlisted two of my trusted collaborators to join the artistic team: Zachery Meier, a Ph.D. in Composition at the School of Music, and Scott Nelson, the Director of Production at Hubbard Street Dance Chicago.

I was drawn to Zach's music because his process was, in some ways, an analog version of my own. His current compositional research is in playing an upright piano by its strings. He exposes the strings by removing the piano's wooden panel and threads rosined fishing line between the strings in intervals that make chords. Pulling the fishing line against the piano strings creates a beautiful, almost haunting tone. The physical action of bowing the piano in this manner elicits its own kind of choreography, one that subverts the traditional method of playing the instrument to create a rich and unexpected tonality.

Early on in the creation process, I invited Zach to meet with the dancers and introduce them to his method of making. Zach, the dancers and I spent a portion of one of our rehearsals taking turns at improvising together to create sounds with the bowed piano. It was important for me that the dancers understand how and why the sound that would accompany our choreography was being created. Zach joined us in rehearsal several times during the creation process to inform his making. His visits, along with rehearsal footage that I made available to him was valuable in creating a score that complemented the structure of the choreography and the movement of the dancers.

The lighting design for *Cmd+Fn* was created and operated by my friend and longtime collaborator Scott Nelson. Lighting and projection design can be a tricky balance — creating a lighting design that supports the projections without washing them out requires a skilled hand. In addition, the intimacy of the Media Theater's floorplan would be another variable to address. Fortunately, I knew that Scott's professional expertise would be able to shape and contour the choreography, support the projection design and contend with the interesting shape of the Media Theater's setup.

After doing an initial walk-through of the Media Theater in September, Scott recommended a lighting package of Martin Mac Aura moving lights that would be versatile enough for the demands of the space. Given that these lights were not available in the Media Theater, I reached out to Wired Production Group of Cedar Rapids to rent the necessary lights. The rental quote exceeded my production budget, prompting me to write a GSS/Graduate College/OVPR Research Grants for Graduate Students in the Arts, Humanities, and Social Sciences for the necessary funds.

As Scott is based in Chicago, the lighting design for *Cmd+Fn* was initially developed remotely. I shared rehearsal footage and drafts of my projection designs with Scott to inform what choices he might make in his designs. We accounted for the particular color palettes at play in my projections and the necessity for highlighting certain areas of the room and the choreography. Based on his recommendation, I opted to costume the dancers in all white rather than in navy blue, maroon, mustard yellow, mauve and forest green. This costuming choice would allow for the dancers' bodies to pick up both the lights and projections. Once Scott arrived we worked together in the Media Theater with the dancers and projections to finalize the lighting cues.

Working with both of these collaborators helped me to anchor some of my ideas and provide structure to the work in a way that would accommodate all of our design aesthetics. Our artistic choices, guided by this spirit of collaboration, helped to support the choreographic collaboration I had already undertaken with the dancers. Together with the cast, the design team and I bolstered partnership of moving media and the medium of movement intrinsic to *Cmd+Fn*'s performance run.

CMD+FN: THE PERFORMANCE

The research invested in *Cmd+Fn* resulted in a 20-minute long immersive, live dance and media performance made specifically for Art Building West's Media Theater. The performance ran four nights from April 17-20 with three shows each evening: 7:30PM, 8PM and 8:30PM. Audience sizes were capped at 35 per show, for a total of 105 per night and 420 in total over the course of the run.

At the beginning of the piece, five of the dancers (half of the complete cast) lead the audience into the space where the rest of cast is situated in a sculptural tableau. The dancers engaged in the tableau buttress the structure by leaning in toward its center and supporting each other's weight. As the audience enters, the dancers in the center send their gaze outward into the room, connecting to the audience as an invitation to notice the architecture of the space, the architecture of the tableau and the shape of the audience's mass as it continues to fill the performance space. Unlike traditional performance venues, the Media Theater's axe-shaped floor plan offers no immediate sense of an upstage or downstage. Instead, the audience is prompted to attend focus to the center of the room where the dancers' own attention is extended outwards toward the perimeter. The dancers who have acted as guides continue to demonstrate how the space might be occupied as they pass through the center of the room and create proximity with the dancers in the tableau.

As the last of the audience files in, the tableau shifts out of its structure and the dancers at the center make their way to the South wall and begin activating the space. One dancer is lifted sideways against the wall, supported from underneath by their cast mates as they walk across the length of the wall and back down onto the floor. At the moment the dancers' feet make contact, the first projection appears. This moment is significant for three reasons: first, it alerts the

audience that dancers' movement is not confined to the center of the space and that all the surfaces of the Media Theater are danceable; second, it introduces the projected media as an active element of the performance; third, it reveals to audience members early on in the performance that they may be expected to shift to a new location, either out of necessity or personal desire.

The dancers continue to travel along the perimeter of the Media Theater, alternating between wall walking and solos. As each of these choreographic segments occurs, the projections on the walls and floor are revealed one-by-one until the entire room has been activated by the physical and digital bodies of the dancers in the room. The entire ensemble then gathers at the south wall, forming a human clump that again traces the perimeter of the space. They engage each other by actively leaning into and out of each other's physical contact, just as they do with the walls and the floor. They travel the perimeter of the room in this fashion, depositing two dancers who begin a duet. As they clump travels, the wall projections begin to fade, leaving only the floor projections active as a series of daisy chained duets is danced on top of them.

The duets resolve as a single dancer solos in the center of the room, reigniting the wall projections and gathering the four other members of their cast. The five dancers perform a sequence complicated not only by their bodies weaving through each other, but also weaving and syncing their tempos and duration. As the quintet turns into a duet and then a trio, the projections shift to the nebulous form of a single moving body presented as multiple layers stacked upon each other.

The soloist who previously ignited the wall projections returns to the center of the space to dance with their counterpart from the other cast. Rather than dueting, they perform their solos

in tandem before gathering the cast for another quintet. This quintet is complicated as their counterparts begin walking and crossing through their dancing space, problematizing their spatial relationships and awareness of each other in the room. As the quintet resolves, a large shift in the structure of the work occurs — both casts gather as an ensemble to carry one dancer to the south wall, setting up a series of wall walking passes that require the audience members to move once again through the space and reconfigure themselves. Photorealistic wireframe figures of the dancers are projected onto all the surfaces of the space, covering their bodies and the bodies of the audience with these digitally traced outlines

The wall walking passes spill onto the floor where the dancers engage in a repetition of hand gesture sequences. These gestural movements are derived from their own mashup choreographies prompted by an investigation of their experience with digital device interfaces. Upon completing this series of repetitions, the casts divide once again. This time they dance in kaleidoscopic quartets and sextets with members of their counterpart casts. As the casts bleed into each other, images of rounded wireframe dancers bathe the space and activate the walls and floor.

The direction of the dance takes a sudden shift as the dancers begin accumulating in a severe walking pattern along the longest diagonal of the axe shaped floor. The sudden linearity is complemented by the projection of Tetris-like blocks, expanding and rotating infinitely outward. These blocks are actually sourced from the captured silhouette of the dancers and rendered into geometric shapes. The grid-like path the dancers travel evolves into two layers of the same choreography, differing only staggered duration, being performed by all ten dancers side-by-side. The projections shift to a fiery, pink and red photorealistic wireframe image of the dancers. The

wireframes expand until they reach the edges of the floor and sound panels and bounce back on themselves, bathing the room and dancers in a bright red glow.

The dancers continue their choreography until one by one they leave the center space and place themselves in the audience. When a single dancer remains, immersed in vivid greens and blues, the dancers return and encompass his figure in form a rotating mass of bodies that simultaneously presses outward and into the center. As they rotate, the floor projection dims for the first time, leaving only the walls illuminated. One by one, the dancers inside the swirling clump stop and hold space in the center, rebuilding the sculptural tableau that their counterparts originally created as the audience walked into the space 20 minutes prior. Once complete, the lights fade and are soon followed by the projections, leaving the dancers in a blackout and signaling to the audience that the performance has ended.

MEDIATING LIVENESS

The media system controlling the video output was comprised of two MacBook Pro computers running Isadora and two Matrox TripleHead2Go Multi-Display Extenders that sent video signal out to projectors mounted overhead on the grid: two projectors were focused on the north wall, one on the south, one on the east, and two laser projectors focused down at the floor. Additionally, four Martin Mac Aura moving lights were rented and mounted to the grid and three speakers responsible for localizing the sound were stationed at three corners of the room.

As each performance unfolded and the dancers guided the audience through the experience, Zachery, Scott and I sat tucked behind a control table in the southwest corner of the room. At each our stations sat the necessary equipment we needed to modulate our particular design departments. The control panels I developed in Isadora allowed me to choose and queue

videos to play at certain moments in the choreography. The control panel also allowed me to fade in and out each of the projectors on all the surfaces. At all moments during each of the 12 performances, I was in a constant state of readiness as I waited for cues in the choreography to arrive that would signal either a change in video playing or for the projectors to come in or out of visibility.

Just as I was making choices with the video playback live during each performance Zachery's system allowed him to modulate the sound in the same way. His setup included a patch developed in Max/MSP (a software similar to Isadora that is more frequently used in live music performance) that gave him the ability not only to adjust volume of the playback, but also localize the sound at the each of the three speakers in the room.

Scott's lighting setup was more traditional in that his cues were already set and simply required "go" commands as the performance unfolded. Because of our limited tech time, however, he did make small adjustments and changes as the run progressed to more adequately shape the dancers and the space.

In the case of myself and Zachery busking our respective media, we were responding in real time to the dancers, the audience and the needs of the space. Whether the audience knew that the media was being modulated live, I cannot say. However, our presence was working in simpatico with the ever changing conditions of the performance at each turn. Because the Isadora control panels I designed gave me full control of the projections and their playback, I had the freedom to adjust how the projections interacted with the performers and audience. On some nights that the audiences were not at capacity, I activated all the surfaces the room to make the space feel more full and alive. At other moments I played with the speed at which the videos might fade in and out to create a more lingering, ephemeral transitions.

While the control of the projections, lights and sound could have easily been ganged together and automated to run via timecode, it was important to me that as these aspects of the performance remain as live as the dancers and the audience. By making real-time decisions in response to what we were seeing and experiencing from behind the control table, we were active participants in the performance. The movement of the dancers and audience happened in relation to our choices, just as our choices were made in response to theirs. Thus, the recursivity and reflexivity of our creation process remained present in the final performance of the work.

CHOREOGRAPHING AUDIENCE INTERACTION

A curious thing occurred as the first audience members entered the room for the opening performance. One by one, they entered in a single file line, created a circle along the perimeter and situated their backs against the walls. They did this because they followed the path of a single dancer at the front of the line who was tasked to lead them into the space. The audience had completely avoided crossing the center of the Media Theater where the tableau of dancers had been set. Moreover, this first round of audience members completely obstructed the view of the performance from the control table. Several times during that run both Scott and I found ourselves having to stand in order to spot the next visual cue. We remained invisible to the audience while in full view.

This first round of audience members provided a wealth of information about how to choreograph the space for them. I immediately learned three valuable lessons. First, the audience will follow whomever leads them into the space in whatever way that person leads them. Second, unless visually indicated by lighting cues or other means, the control table and its operators are invisible to the audience. Third, throughout the performance the audience will look to the

dancers for direction and movement cues. Bearing these lessons in mind, I quickly instructed the dancers in between the first and second shows to lead the audience through the center of the space, rather than walking a circle around the perimeter, and tasked them to act as guides for the audience throughout the piece for their own physical safety and for the practicality of operating the projections, lights and sound.

As each night progressed, the dancers became more aware of how to tend to the needs of the audience and provide them with cues for moving through the space, either by eye contact or physical contact. As the dancers became more adept at activating the audience, they became more present inside of the performance. Rather than acting passively as audience members themselves, the dancers at the perimeter utilized their own agency to move through the space and become examples of how audience member might navigate the performance. The dancers became docents inside the performance, facilitating the audience's experience.

This rapid education for myself and the dancers was necessary because, despite the length of our creation and rehearsal process, we were never able to fully account for how an audience might engage with the show. The audience in each performance was an unknown variable introduced into the system every twenty minutes. Their experience and choice making inside the *Cmd+Fn* world exhibited influence on the accessibility of the space and the performance of the dancers. In the same way that digital interfaces choreograph movement on their users, *Cmd+Fn* prompts and elicits choreography from its audience members. This was a choreographic system I could not entirely account for in any of our rehearsals.

By choreographing proximity as a requirement for experiencing *Cmd+Fn*, I was asking audiences to engage with dancing bodies and digital media in a way they may have never experienced before. My assumption was that this experience would simply provoke a sense of

wonder and curiosity. I did not assume that the audience's experience of *Cmd+Fn* would necessarily illuminate the particulars of my research aims, but I was unprepared for some of the responses it did provoke. While many audience members experienced delight at having agency inside the performance, for others, it plainly created discomfort — this much was audible to me from where I sat. That one might enter a space and be required to participate in the act of the performance can be annoying for some, unnerving for others, or even dangerous for certain audience members.

In much the same way that I consider digital interfaces and technological interventions a means of choreographing the behaviors and movement patterns of end users, I find an interesting parallel in considering the audience the penultimate user of the of the *Cmd+Fn* experience. Some digital interfaces may appear intuitive in their use and design because they are coded with known and recognizable command features — these interfaces privilege users for whom these technologies are easily accessible. Conversely, other interfaces may appear confusing or frustrating because they are geared toward users with advanced knowledge of how to operate within their ecosystems. Depending on the audience member, the experience of *Cmd+Fn* could be described as existing on either end of the spectrum — easy and accessible or confusing and frustrating. This perception is inherently tied to the ways that performances are coded for audience consumption and the ways that audiences are coded to consume performance.

CONCLUSIONS + FINDINGS

I am proud of what my collaborators and I produced through *Cmd+Fn* — it was an undertaking far greater than any I had experienced as a maker and required a complexity of workflows that, while daunting at first, were ultimately achievable. Having produced and

developed this experience, I feel even greater curiosity to develop more complex live dance and media events. The research that I have concluded through this project marks the starting point for other lines of inquiry upon which dancing bodies and digital images serve as a vehicle for discovery and not simply its subject.

Cmd+Fn began as a meditation on the ways that digital devices and interfaces produce and elicit choreography from their users. I relied on this supposition as a means to provide structure and workflows for both my studio practice and my digital practice. This started for me as an exercise and experiment in forms. I was interested in colliding my two creative research practices and discovering what might happen at their result. The work was not built around a narrative structure or an attempt to deliver a didactic comment on the relationship of human beings and human movement to digital interfaces. Rather, it was an attempt to simply amplify the conditions of contemporary living that I experience on a daily basis — dancing bodies and digital images.

I firmly believe that dance not only *is* a thing in the world but that it *does* a thing in the world — that the means with which bodies inhabit and activate space are tied to cultural, historical, social and economic conditions and labors. These means are both a product of those conditions and simultaneously a comment on them. I believe that *Cmd+Fn* does exactly this — its creation and performance are simultaneously a product of the quickly moving nature of technological interventions and a means to call into question the structures and interfaces, digital or otherwise, that provide the code for navigating the complexity of contemporary living. By tasking choreographic research to investigate command structures and hierarchies, *Cmd+Fn* is a manifesto for making that prioritizes dismantling and repurposing as means to generate new knowledge.

APPENDIX A: THESIS III MACARANAS CONCERT PROGRAM

Cmd+Fn

DOI:

<https://doi.org/10.25820/5sy9-nk95>

<https://doi.org/10.25820/sphc-sz19>

<https://doi.org/10.25820/8csn-ax32>

Choreography: Marc Macaranas, in collaboration with the performers

Media Design: Marc Macaranas

Rehearsal Director: Bethany Sullivan

Music and Sound Design: Zachery Meier

Lighting Design: Scott Nelson

Technical Consultants: Will Borich and Nick Coso

Costume Design: Juliana Waechter

Stage Manager: Mariana Tejada

Media Design Consultant: JD Whitman

Performers: Grace Andersen, Aaron Choi, Keely Flis, Bennett Cullen, Marcus Pei, Corbin Phillips, Quincey Scholz, Sonja Schulz, Bethany Sullivan, Anna Wetoska

Thesis Committee: Daniel Fine (chair), Rebekah Kowal, Melinda Jean Myers

This concert is supported by a GSS/Graduate College/OVPR Research Grant.

APPENDIX B: REHEARSAL DIRECTOR JOB DESCRIPTION

The role of Rehearsal Director is traditionally meant to facilitate many aspects of a rehearsal process including: managing rehearsal schedules, maintaining repertory, leading and coaching dancers in rehearsal, and in some cases functioning as a repetiteur of the choreography. The Rehearsal Director will be responsible in the rehearsal process of *Cmd+Fn* in the following ways:

- Engage deeply with the creation process and model a nuanced knowledge of the choreography to the cast
- Maintain the intention of the choreography and its movement quality when leading or coaching the dancers
- Help create and manage day to day rehearsal agenda in consultation with the choreographer, prioritizing sections of the work that need most attention
- Facilitate documentation, delivery and execution of rehearsal notes in tandem with the choreographer
- Lead rehearsals and review notes and sections if/when necessary
- Observe the role of cast representative
- Lead the dancers in a warmup conducive to the needs of the choreography, when necessary

APPENDIX C: GSS/GRADUATE COLLEGE/OVPR RESEARCH GRANT PROPOSAL

Cmd+Fn (pronounced “Command Function”) is a Dance MFA Thesis Concert scheduled for 12 performances from April 17-20, 2019 in the Media Theater of Art Building West.

Through choreographic experiments, real-time video interactivity and immersive projection design, *Cmd+Fn* explores modes of bodily agency and asks its participants to rethink the edges of where choreographer, audience and performer meet. This creative research considers how digital interfaces function as instructions for users and how these tools for interaction impose a choreographic and compositional logic that can be abstracted, amplified and reimaged on live, dancing bodies.

At play in the week-long performance run are a cast of 10 dancers, nearly 500 audience members, and an interactive media system that transforms the interior of the performance space into an immersive video environment. Because of its unique technical needs, *Cmd+Fn* will be presented in the Media Theater of Art Building West (ABW250) where video projectors are already mounted and ample wall space exists for floor-to-ceiling projections. Its gallery configuration allows for an audience-performer proximity and interaction not typically achieved in proscenium theaters.

The necessity of this venue presents a particular challenge — whereas Dance MFA Thesis concerts are typically performed in Space Place Theater, *Cmd+Fn* is considered an “off-site” concert and does not receive the full production support a standard thesis concert would. While I have assembled my own team including a stage manager, house manager, technical crew and lighting designer to produce the show, the Media Theater does not have the essential lighting equipment necessary for this type of production. As such, I’m requesting a grant in the amount of \$1000 to cover the fee to rent 6 Martin Mac Aura LED lights during the week of the show.

Lighting is a crucial component to this performance. Without a lighting system in place, the rigor I've devoted to my research, including choreography, projections, and audience interactivity, will be entirely stunted.

Creating lighting for a live dance and video projection performance like *Cmd+Fn* is a complex procedure that requires an experienced designer who is equipped to work in non-traditional performance venues and can design for dancing bodies. One danger when working with lighting and projections is that poor lighting design can often wash out the projections, creating a muddy, murky experience that diminishes the effect of both. Because of this, I'm collaborating with a professional lighting designer (Scott Nelson, Director of Production at Hubbard Street Dance Chicago) to develop a lighting design that highlights and frames the choreography without competing with my projections. This collaboration is an essential to my creative research, allowing me to engage with my choreography from another designer's perspective and situating myself as a design expert as I prepare to re-integrate myself into the professional market.

Making *Cmd+Fn* confirms a trajectory shift in my creative research. As I've honed my choreographic skills during my graduate studies, I've begun to bridge my choreography away from traditional dance stages and mediate them with digital technologies. Between creating short experiments in dance films for social media, creating body based projection designs for live theater performances, and programming an interactive dance installation on a 4K touchscreen for the Digital Scholarship & Publishing Studio, I have generated a practice that employs choreographic strategies as a basis for digital content creation.

Completing this project requires a more keen and nuanced level of artistic production than I have previously attempted. This performance exists on a scale that, while daunting, will

establish a benchmark for my future creations and collaborations, provide a template for pedagogies in dance and digital media, and open new modes for *Cmd+Fn*'s participants (both performers and audiences) to consider their relationship to dance and technology.

Timeline:

August – December 2018: Studio rehearsals, documentation and projection design testing begins

The choreography is crafted collaboratively with my cast. The generative movement prompts are inspired by the physical actions and command gestures (swiping, tapping, pinching to zoom, double-clicking, dragging, etc.) common to digital interfaces. Once generated, the movement sequences are then restructured and remixed by the dancers. Eventually, each movement sequence is treated as a “layer,” similar to a composition sequence in Adobe Premiere Pro and After Effects. These layers can then be stacked on top of each other, rearranged, masked, or altered in any number of modes to become a choreographic sequence.

The rehearsal process is documented, archived and shared on Instagram. Each of the dancers has an Instagram account specifically for this project. Our main account (@cmd_fn) archives their movement research inside and out of the studio and offers a portal into the making of the project via posts, livestreams and stories. As the process develops, the dancers and I will designate hashtags that describe the work and situate our online presence in the broader Instagram community. In addition, audience members will be invited to capture, livestream and share their own experience during the performance to their own social networks.

Footage from rehearsals is being used create preliminary looks and designs in Adobe After Effects. These design tests are being mediated via Isadora, a visual programming language designed specifically for live, interactive performance.

January – April 2019: Finalize choreography and projection design, install in Media Theater and complete performance

Green screen footage of the choreography will be digitally edited to remove the background, leaving only the dancers' moving bodies. This footage is edited and manipulated in After Effects to create the projection designs. Utilizing a network of MacBook laptops running Isadora and an array of video projectors in the space, the projections will be displayed on all the surfaces of the Media Theater as dancers and audience travel through it. Xbox Kinect cameras interface with Isadora, capturing the motion of the dancers and audience via infrared sensors to displace, distort, and augment the projections.

The entire production including dancers, media and lighting systems will be installed on April 14, 2019. Following tech and dress rehearsals, 12 performances run from April 17 - 20, 2019.