The Digital Tool in the Curious Maker’s Hand: Critical Exploration Processes to Engage Historical Paintings for New Inquiry and Dialogue

Thesis

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Abstract

Virtual 3D media, immersive environments, interactive media, and digital image manipulation are just a few examples of digital tools that can provide a new perspective and engagement with visual subjects of interest. When exercised within critical making and play processes, digital tools can create opportunities for new observations and new inquiry surrounding an image’s formal and narrative construction. This thesis explores how digital media can be employed in making and play processes to function as a method of inquiry when examining complex visual content. Historical paintings possessing elements of believable environments serve as a case study, in which the method of digital inquiry is applied via research-oriented design. The result is a non-linear customized methodology that draws upon critical making, critical play, digital craft, experiential learning, and rhizomatic thinking to synthesize new understandings.

This document surveys several theories supporting the construction of the research methodology followed by an overview of creative projects that contributed to its conceptual development. The methodology itself consists of a selection of events, which can progress flexibly to fit the researcher’s curiosity. The methodology review is accompanied by samples from a creative project exemplifying each event in the process.
Dedication

This document is dedicated to my many friends and faculty at ACCAD and the Design Department at Ohio State University, as well as my loving family; Your support has not only made my education possible but shaped the person I am proud to be today.

Thank you.
Acknowledgments

I wish to send a tremendous thank you to my advisor, Jeff Haase, for always being the jolt of creative energy I needed, as well as a constant reminder that I love what I do: making things. I would also like to thank my additional committee members, Maria Palazzi and Deb Scott. I can never say enough good things about Maria and her genuine supportive mentorship through my entire time at Ohio State. I attribute so much of my development as a researcher to her guidance. As for Deb, I remember a very engaging conversation the first time we met during the weekend I moved to Columbus. Little did I know, that conversation was just the beginning of many more to come; all of which gave me essential perspectives on my research. Lastly, I send a special thanks to Sarah Lawler and Kien Hoang for sharing all of our triumphs, struggles, and journeys through this experience.
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Preface

I don’t want to bore you with an “it all started when” story... but we all did start somewhere, which can frequently be rooted in our childhood. So I’ll try to dance around cliché and run through my start before we dive into this document. I would say this research did indeed start with my childhood. Making things was what defined me. My bookshelves were full of titles featuring “How to Draw...” or “Origami,” and my personal favorite, “Learning Hieroglyphics.” This little kit came with stamps, scrolls, and even clay to engrave your hieroglyphics into. Although not the most practical skill to learn, I did learn something. That was my way of understanding: I made things. When I participated in these activities, I was no longer an observer, but part of what they were. Not to mention the ownership and pure satisfaction over the things I made and what they represented in my learning process.

I was also a very curious child, obsessed with fantasy, worlds that didn’t exist, and stories that demanded you shut out reality until it’s time to return. When I couldn’t get enough of these fictitious worlds, I would turn to making. I remember frequently drawing characters from favorite stories, recreating scenes in Lego, and using the classic Indiana Jones plot as a basis for pretend play with friends and family. I dug into these
things that tugged at my imagination and I pulled out something I could make my own, something I could expand into my world.

Oddly enough, it took me 20 years to realize just how integral these little moments were to the person I am today, my interests, and the things that bring me joy. These moments of making, play, and fantastical indulgence have ultimately culminated in this research. When you’re done reading this document, I invite you to return to this quirky snippet. I think you’ll find that this research is, in fact, child’s play. At least in the context of my own childhood. I’m thrilled to say that I got to do what I have always enjoyed doing: making, playing, exploring, and diving into my curiosity. When that happens, the aspects of our beginnings are no longer just memories of our childhood... they are treasured qualities of our lives, and what defines us.
Chapter 1. Introduction

In a talk at UC Berkley titled, “Nine Classic Paintings Revisited,” filmmaker Peter Greenaway presented several of his video works featuring digital visualizations projected onto Rembrandt’s The Nightwatch and Leonardo DaVinci’s The Last Supper. The short films show the still images with moving elements of playful light working to reveal a dynamic three-dimensionality in the spaces painted by renown masters. Greenaway alters light sources, animates narrative features, and introduces graphics alluding to the formal construction of the historical pieces. Animated rain and fire overtake the group of townspeople in The Nightwatch while Judas receives a darkening absence of Christ’s light in The Last Supper. Contours are dynamically traced, saturation shifted, and minute hand gestures are visually isolated in Greenaway’s projections on these masterpieces. These visualizations cast the paintings in a light that we have never seen or imagined before.

\[1\] Peter Greenaway, “Nine Classic Paintings Revisited,” (presentation at the University of California, Berkley, CA. September 14, 2010). http://townsendcenter.berkeley.edu/media/nine-classic-paintings-revisited
As an advocate for developing visual literacy, Greenaway uses digital visualization techniques to inspire the way we observe complex imagery. An incentive of this method surrounds contemporary generations, who are familiar with modern digital technology; this group of people Greenaway likes to refer to as, “the laptop generation.” He states that among the confusion and mystery that shrouds the paintings with text, his approach is to demonstrate to the laptop generation that the technology they are familiar with can be used as a powerful way to examine these masterpieces.² With inspiration from his own way of viewing and literature that discusses the images’

concepts and formal elements, Greenaway employs digital tools to bring information to the surface of paintings in ways that are not possible with the naked eye. This space between digital media and classical painting that Greenaway opened became immensely intriguing to me.

After watching these reimagined experiences of works I already knew quite well, I realized there was so much revealed to me that I had not even registered before. Compositional elements surfaced, narrative visuals begged deeper consideration, and the scene itself incited novel curiosity that simply was not present when viewing this static imagery with the naked eye. The most significant part of this experience was that Greenaway has used no text or verbal communication in his work, yet I felt as if I had gathered a deeper understanding of work that had been contently sitting in the back of my mind for years. It was Greenaway’s digital magic that sparked my research interest. I became deeply interested in how digital media could expose less obvious qualities of historical paintings: elements that I could not observe with the naked eye, information that is not present in the painting, and ideas that fill in the conceptual gaps of curiosity surrounding the enigma of complex images.

Countless masterpieces visually immortalize places, people, events, and stories of the past. Yet, historical painting has become artwork that we look at and learn about through text; we rely on experts and a plethora of written text to tell us methods of viewing the images and what they present to us. But what if we could return to these works of art with a fresh set of eyes? What if we could observe them in a completely
unconventional way as Greenaway proposes? Could a new lens reveal new observations, new inquiry, and new engagement with them on an analytical level? I argue that digital media approaches can be expanded with reflective exploration processes to make this possible.

The use of digital tools in tandem with processes of creative making can provide an opportunity in which we are able to examine the content in an alternative way. With a creative hand, a curious mind, and an embrace of many possibilities with digital tools, new observations and inquiry can lead to synthesizing new meaning. This may occur through a process of creating a digital artifact or a process of playing with a digital artifact. Play, in this context, refers to indeterminate experimental interactions to alter the state of a form. With new observations and an opportunity to expand our understanding, a possible outcome of this approach is the potential to revisit and rethink what historical painting means in our contemporary lives. This research demonstrates and experiments with ideas of deep exploration of existing artwork and possibilities gained in the merging of digital media technology with the experience of expanding the viewing of artwork. With thousands of years of artwork, I chose to focus on paintings between the late Renaissance period and the surrealist movement, due to a sense of believable or inhabitable environments.
I approach this research with a unique perspective. My skillset is rooted in digital art ranging from animation to games, to 3D virtual modeling. I work with intangible material with reversible capabilities; quite simply, these materials are never in a permanent state. They exist in a spectrum where any action can be performed and undone. It is also an extremely broad selection of materials and potential forms. Games, for example, can have a nearly unlimited number and type of interactions and outcomes, while there is only so much one can perform within the traditional practice of painting. The potential of digital media includes multi-sensory experiences including interaction, immersion, physical impossibility, and motion.

Even though my expertise lies in digital materials, I have long held an appreciation and interest in traditional art. I am fascinated with classical paintings that primarily deal with realism or believable environments, which could be imaginatively inhabited by the body. Their ability to suggest illusory spaces invites me to delve into the many possibilities and imaginative experiences they might portray. I observe historical paintings with a specific perspective that is influenced by my background as a digital artist. My mind yearns to extrapolate the paintings’ rich content to imagine tangential concepts, spaces, and time-based experiences. I cannot help but translate their content into a flexible digital form in which I practice. When this occurs, I access the core concept or narrative the images represent with an alternative perspective. In
terms of practicality, digital media is a deliberate choice to merge with paintings. When applied to still images, it has several advantages that I will discuss throughout, including material capabilities (affordances), efficiency, and flexibility. In chapter 2 I will discuss how I borrow from digital media and influential theories to develop my exploratory process.

I also consider myself a very curious person. With curiosity comes a willingness to ask, investigate, and learn on a personal and participatory level. As a digital artist, I am always prepared to participate in creative endeavors; this active making coupled with a curious, investigative mind sets me up for employing critical making as my primary method of inquiry. Making things has always been a way for me to better understand. This can be true for any individual possessing the curiosity and willpower to create, question, and consider their experiences. With my background as a digital artist and my trait of curiosity, my interaction with historical paintings is influenced by my method of observing and my method of inquiry. I imagine the painting in alternative ways and extrapolate them into questions, which are investigated through a process of making and play. In chapter 4 I lay out my method of critical making with digital tools within its application to investigating five paintings by painter and Hudson River School founder, Thomas Cole. This method is presented as an unconventional and non-linear approach to inquiry with influence from critical making experts like Matt Ratto and Malcolm McCullough. I will explain and demonstrate various “events” that occur within this method of inquiry, how digital media and making practices drive them, and how
they develop a new perspective of the paintings being examined through a case study of my own creative work.

Research Questions

In this research, I will examine questions dealing with critical exploration processes centered on digital media, making, and play. The conceptual question I ask aims to provide a wide suggestion of what is possible within this critical exploration. How can critical making and play with digital tools function as a method of inquiry? I address this question by applying relevant theories to reflective acts of exploration with digital media to develop a custom method of inquiry. I argue that this question is conceptual because it helps us to understand a more abstract idea of the use of digital tools within reflective exploratory processes for generating new inquiry and knowledge.

I then ask a question aimed to demonstrate how the method can produce new knowledge. This provides an opportunity to exercise and expand upon Greenaway’s ideas by using painting as a case study. How can critical exploration processes with digital tools uncover new or hidden information in a historical painting? I explore this question by applying my method of inquiry to Thomas Cole’s five paintings in The Course of Empire. This serves as an applied question because I not only exemplify the method’s application but opening dialogue that continues Greenaway’s discussion of the intersection of digital media and paintings. By framing the method’s functionality this
way, we can identify problems associated with the traditional act of viewing historical paintings and generate more practical questions that address those problems.

What’s in it for you?

If you are a designer, an artist, or a researcher, you will be invested in the majority of this research. I demonstrate the power of critical making and its ability to open an understanding of our own process, as well as a deep analysis of the content or subject being worked with. The making process is rarely linear. We make and respond in a kind of dance with our process. Understanding critical making has indeed made me a better designer and researcher. If you are a design researcher, you will be interested in the development and application of the method of inquiry with digital tools. In chapters 3 and 4 I review preceding creative work that conceptually contributed to the development of the method, as well as a detailed review of how the method can progress. I also encourage you to review chapter 2, which surveys contributing theories. The development of my digital method of inquiry exemplifies a balanced dance between theory and practice. This process expanded my understanding and affinity with research through design. Lastly, if you are an artist, art historian, or museum educator, you will find this research opening possibilities and discussions of the visitor experience. There is densely rich narrative, dialogue, and expression in countless artifacts in exhibition. Could it be possible to make them a more accessible, engaging, and impactful? Can
digital artifacts aid the museum educator by introducing playful and creative approaches? The use of digital media and interactive techniques in this research can serve as an example and initiate the generation of new ideas and experiences between our cultural artifacts and their human heirs.

I will begin by reviewing several theories that contribute to and inspire my exploration processes. Following this, I will discuss the conceptual development of my method of inquiry and its lineage through preceding creative work. Throughout this review, I will also intermingle current approaches by other makers and theorists that demonstrate these ideas and inspire my work further. Upon the end of this review, I will progress through the construction of my exploration process with Thomas Cole’s paintings. This will conclude with an evaluation of the implications of the research with estimations of its future direction.
Chapter 2. Background

My research is influenced by several theories, which I combine to inspire my method of inquiry with digital tools. Two theories represent the application of those digital tools through acts of making and play. Critical making and critical play theory influence the generation of inquiry within my exploration of historical paintings. Making and play might seem like easily definable acts that are part of everyday life, but what does it mean when they are framed as “critical,” and in what ways are they similar? Another section of review examines Malcolm McCullough’s discussion of processes of making with digital tools. I will highlight specific advantages of digital media in the context of this research and how they drive my unique perspective as a digital artist. Lastly, I will review Deleuze and Guattari’s rhizomatic thinking theory and David Kolb theory on experiential learning in the context of generating and pursuing inquiry in my research. A final conclusion will provide a brief review of these theories and how they interact in my research.
Critical Making

Critical making is an act that involves both analytical reflection as well as the construction of artifacts. Matt Ratto is a leading figure in critical making research and describes the process occurring in three phases, any of which a project may begin in. One phase consists of reviewing literature, concepts, and theories as an inspirational foundation of curiosity. This provides concepts to be explored through practice. A second phase involves “mapping” these concepts and inspirations to prototypes in which the ideas are explored. Ratto describes a third phase including, “an iterative process of reconfiguration and conversation, and reflection begins.” I am particularly fond of Ratto’s explanation of creative efforts in this phase, “wrestling with the technical prototypes, exploring the various configurations and alternative possibilities, and using them to express, critique, and extend relevant concepts, theories, and models.”  

Ratto also discusses critical design and its similarity with critical making. He describes critical design as an activity of designing artifacts that embody concepts with the intention of observers becoming aware of alternative perspectives of those concepts. Critical making, on the other hand, is more reflexive by offering new

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perspectives to the *maker* versus a public viewer, which occurs through process. Ratto’s efforts are focused less on the objects that result from critical making, but rather on the act of making itself and the information generated from process. He describes his goal as, “not to create objects that in their apprehension open new visions and possibilities for observers.”\(^5\) Ratto is more interested in using the process of making to achieve a similar goal of “opening new visions,” but for himself as a researcher versus a public observer.

Ratto finds alignment within design-oriented research, rather than research-oriented design\(^6\). Design-oriented research meaning that the goal is research and design is the method, while research-oriented design implies the goal to be design, achieved and influenced by means of research\(^7\). The distinction between critical making and critical design is suggested in this statement respectively. This is reflected in Ratto’s claim that his focus is not the objects themselves (the designs) but the experience of making and the information resulting from the process (the research). I participate in both with my research thread; however, this document focuses on critical making while my trajectory in this research focuses on how critical making can influence critical

\(^5\) Ratto, “Critical Making,” 254

\(^6\) Ibid.

\(^7\) Fallman, Daniel. “Why research-oriented design isn’t design-oriented research: On the tensions between design and research in an implicit design discipline.” *Knowledge, Technology & Policy* 20, no. 3 (2007): 193–200
design. I argue that my research bridges the two acts of critical making and critical
design based on Ratto’s review. Within critical making, there exists a subcategory of
action in which the prototypes become more significant in terms of what feedback they
provide in response to material manipulations. This is especially present in digital
artifacts that are interactive, in which their form can easily change states; this enables a
process of experimental and reflective play.

**Critical Play**

Mary Flanagan is a prominent theorist on critical play, which she discusses in her
book, *Critical Play: Radical Game Design*. Although much of critical play is framed in the
context of gameplay in her writing, I would like to examine play itself as a reflective
process of experimentation. Flanagan defines critical play as an act that embodies a play
space with activities that represent questions about human life. She also suggests that
criticality in play can be used to inspire inquiry into things that may have been
overlooked or lack consideration by the participant. She states that “Criticality can
provide an essential viewpoint or an analytical framework.”

This description resonates with Ratto’s reflective process of making, which shares an identical intention of inquiry

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and expansion of concepts. Since Ratto and Flanagan describe reflective acts, it is understandable that both making and play can be used for similar purposes of inquiry. Criticality can function as a separate quality spanning across multiple processes, including making and play. However, what defines play?

There are many ways in which play has been defined and discussed in an academic light. I am most interested in defining play as it is situated within critical processes, and in this review, I contextualize acts of play as experimental interactions. It is difficult to see play as an open process of experimentation, especially when we commonly think of play in the context of games. We often imagine play as an entertaining activity that is subservient to a game’s goal and rules. Although play and games are related, this relationship is more hierarchical versus correlative. While all games require some element of play, not all play must be situated within a game. Acts of play themselves do not constitute games.

Greg Costikyan helps to clarify the distinction between play and games when he states that games without goals are not games at all; they are toys. A toy may offer a multitude of interactions and possibilities of ways to play; a simple ball serves as a common example. A ball does not inherently come with rules or goals, we must embed our own into the play to give birth to a variety of ball-games. In this situation, play is

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existing as a process of manipulating the state of a toy through a selection of possible interactions. I argue that the artifacts I am playing with are actually digital toys. I have no explicit goal to achieve when interacting with the digital artifacts; instead, it is a process of experimentation. Since criticality can act separately, the process can still be reflective and inquisitive regardless of the play being organized into a game or not.

This perspective of play as experimentation is also inspired by Abstracting Craft: The Practiced Digital Hand, in which Malcolm McCullough frames play as a method of improvisation. However, he does this in the context of making processes. I argue that play as experimentation can function as an important part of critical making. Making and play converge as acts that manipulate materials. I present these processes as overlapping activities, in which play can possess creative qualities, and making can possess playful qualities. McCullough suggests that play occurs when we improvise and experiment with materials to better understand their qualities and potential outcomes. The interaction and response between the user and material serves as an act of play, which helps us to learn about our own process and subject. Since the intention is to understand concepts or qualities of a subject matter (in McCullough’s case, a material), the play is still considered reflective and critical. I see the shift between making and play

oscillating when determinacy is considered. Making can be framed as a more
determinate activity with a conceivable outcome to produce, while play is framed as a
more experimental process with indeterminate results to be explored. Since these
activities can merge together under the same umbrella of criticality, I refer to their
joined existence as “critical exploration.” This references their shared critical agenda of
generating inquiry and exploring concepts. These overlapping processes of making and
play become quite powerful when engaged with digital tools.

_Digital Craft_

Digital tools have many advantages within creative processes and one of the
most prominent qualities that provide an advantage is the immense flexibility and
nearly infinite possibilities they can produce. Returning to McCullough’s writing, I review
these advantages as well as a predictive state of mind that anticipates the outcomes of
digital manipulations, which McCullough calls “mental models.” I identify three primary
qualities of digital media that give critical exploration processes an edge over physical
media. These qualities are reversibility, continuums, and affordances.

Reversibility is an advantage that increases efficiency in experimental processes.
Because the actions on digital content are not permanent, there are an increased
amount of possible explorations in a given time versus a physical medium. McCullough
describes this advantage nicely as, “reversible operations on bits as opposed to
irreversible operations on atoms."\textsuperscript{11} With this advantage, I can perform many actions without additional material, or fear of permanence. This is extremely powerful, specifically in acts of play as an experimental process where the risk of failure can be hindering. With physical forms, there must be consideration of the cost, quantity, and time required to explore a form of the medium, thus sacrificing potential options in the favor of plausibility. Without these risks and considerations, there is nothing preventing me from trying any possible state of existence within the affordance of that digital medium. Reversibility that allows for efficient exploration is also complementary to a continuum of possible forms.

McCullough describes a design continuum as a gamut of possible forms in which between two forms there always exists another. This portrays experimentation of digital forms as operations on a spectrum of manipulations. Digital tools allow for changes on a continuous vector, in which manipulations can be fluidly observed, especially in realtime transformations\textsuperscript{12}. Drawing on tracing paper versus drawing in Photoshop is an example of this. With physical materials, I must make an iteration for each change I imagine. Each iteration represents only one manipulation of form. However, digital drawing in Photoshop allows me to make a realtime change, like a simple hue manipulation; this change not only takes less time, but I also have the ability to observe every

\textsuperscript{11} McCullough, 52

\textsuperscript{12} Ibid, 171
manipulation in between the previous state, and a new state. Coupled with reversibility, I have the potential to explore multiple forms in one realtime manipulation without committing to the permanence of any. Being able to experience multiple forms without having to imagine them first is the significant advantage that digital continuums can offer with procedural approaches. This reveals unexpected states of the form that may have been skipped over or unimaginable.

McCullough also describes the affordance of digital media, which determines the boundaries and possibilities of the tool\(^\text{13}\). Digital media offer drastically different constraints compared to a physical medium, partly because there are so many possibilities of form under one board umbrella of digital tools. Time, sound, interaction, and immersive qualities are just a few affordances that one physical medium simply cannot possess. However, all of these qualities can be embodied in digital forms like video, audio, games, and virtual reality. Digital affordances drastically shift the perspective of content because there are no constraints of the physical world upon the virtual medium. However, with so many possibilities producible by digital tools, there needs to be a familiarity with how they can give form.

With these advantages of digital tools, McCullough advocates for the development of mental models in exploratory processes. He describes these as predictive states of mind that can anticipate how and what forms can be generated with

\(^{13}\) McCullough, 198.
specific digital tools. These mental models are contingent on the affordance of the
digital tool. Accompanying affordances are design worlds. McCullough defines these as
the realm of possibilities in which a digital medium can construct content; each realm
can provide a lens to look at design problems, leading to different and unique
perspectives\textsuperscript{14}. We can think of mental models as an understanding of how the digital
tool could behave within a specific design world based on its affordance. It is therefore
essential to be familiar with a variety of tools in one’s repertoire so to construct mental
models of appropriate tools in the right design world. Understanding the affordance of
different tools can improve the mental modeling of what its possibilities are as it is
passed into a design world. In turn, understanding different design worlds can provide
an opportunity to select an appropriate lens through which to view curiosities.
However, we rarely predict or simply know these things from the start.

McCullough provides a clever anecdote for mental modeling in which he asks
how one might count the windows in their home. The windows are not physically visited
and counted, but rather a mental construction, or model, of the house is reflected upon
to estimate the response\textsuperscript{15}. The requisite in this example is that there must exist a
familiarity with the house’s construction for a reliable evaluation. So how do we develop
a familiarity with a digital tool’s affordances and design worlds so to possess reliable

\textsuperscript{14} McCullough, 185.

\textsuperscript{15} Ibid.
mental models? Quite simply, we try, we fail, we learn, and we try again. This is the basic structure of iterative making. Critical making and play not only drive inquiry, but they also help to develop experiences that are pivotal to constructing accurate mental models. Play contributes significantly to this process when it is contextualized as an improvised experimentation. Reversibility and continuums optimize experimental play so one can build an understanding of the affordance of different digital tools and the design worlds they can exist in. This process is most like play versus making because the experimentation is not necessarily determinate; indeterminate interactions are performed to discover what is possible and to develop a mental model. Through this iterative experience, one can develop greater mental models to predict the potential constructs of interest, thus making informed and determinate decisions during exploration. McCullough sums up this advantage nicely when he says, “Play serves learning through experimentation without risk.”\textsuperscript{16} Playful processes can build up a mental modeling of a digital tool for appropriate predictive application in more refined exploratory actions.

\textit{Rhizomatic Thinking}

The way in which I generate questions and pursue them in my process is greatly influenced by rhizomatic thinking. This concept is introduced in Deleuze and Guattari’s

\textsuperscript{16} McCullough, 223.
book, “A Thousand Plateaus: Capitalism and Schizophrenia.” Rhizomatic thinking references a botanical rhizome, which is a plant that consists of a root network of nodes that grow horizontally versus a vertical tree-like branch system. This mode of thinking appropriately adopts this rhizomatic structure and suggests that thought progresses in an interconnected network of “nodes,” where each thought is connected to another and there is no logical start or end to this development\(^\text{17}\). The structure of rhizomatic thinking is also described as a map. It is a multi-dimensional layout of connections, in which there is no beginning or end\(^\text{18}\). Where does one enter a map? Rather than starting at a root and progressing through thoughts that branch off, the process can be entered at any point and is “in the middle.” Deleuze and Guattari describe the rhizome as having, “no begging or end; it is always in the middle, between things, interbeing... The tree is filiation, but the rhizome is alliance, uniquely alliance. The tree imposes the verb ‘to be,’ but the fabric of the rhizome is the conjunction, “and...and...and...”\(^\text{19}\). This method of thinking is beneficial in my process of exploration with digital tools because the process is rarely linear. The simultaneous, connected, cyclical process through which I generate inquiry applies rhizomatic thinking in a fitting way.

\(^{17}\) Gilles Deleuze and Félix Guattari, \textit{A thousand plateaus: capitalism and schizophrenia} (Minneapolis: University of Minnesota Press. 1987),

\(^{18}\) Ibid, 12-15.

\(^{19}\) Deleuze and Guattari, 25.
Experiential Learning

David Kolb’s experiential learning cycle is an apt illustration of the relationship between making and play processes and reflective criticality. In an abstract manner, Kolb demonstrates how inquiry can be developed through experiences. This occurs in a cycle of having an experience, making observations, creating meaning based on reflection, and repeating the process through a tested experience of that meaning. More specifically, this cycle can describe the make and respond nature of critical exploration processes, which constitute experiences that are reflected upon in iterative acts. Figure 1 illustrates Kolb’s cycle.

Figure 2. Kolb’s experiential learning cycle.
The first is Concrete Experience, which is the stimulus being experienced. Next is an act of thoughtfully processing the stimulus, referred to as Reflective Observation. The third is Abstract Conceptualization, which Kolb describes simply as “thinking.” This is primarily where new questions might arise and best represents the criticality of exploratory processes. Ratto’s critical making phase of mapping ideas into artifacts is represented in Kolb’s final stage of Active Experimentation. This stage refers to acting upon the inquiry or thought provoked by observation to test the hypothesis. This leads back to new experiences and repeats the cycle. Kolb sums up the process nicely by saying, “Immediate or concrete experiences are the basis for observations and reflections. These reflections are assimilated and distilled into abstract concepts from which new implications for action can be drawn. These implications can be actively tested and serve as guides in creating new experiences.”20 This method of developing inquiry is fitting for critical exploration with digital tools as well as the “and,” nature of rhizomatic thinking.

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**Theories Working Together**

In this chapter, I reviewed five theories that contribute to my method of inquiry with digital tools and critical exploration process. Those theories are critical making, critical play, digital craft, rhizomatic thinking, and experiential learning. There are two overlapping areas that these theories cover, which are represented as creative experience and inquiry. Creative experience includes activity in which I am manipulating and experimenting with materials. Inquiry consists of generating questions and thought. McCullough’s digital craft theory represents the creative experience side of theory by describing advantages of digital tools that I can use to manipulate materials. Rhizomatic thinking and experiential learning represent the side of inquiry by contributing to the way I develop questions. Critical making and play bridge these two theoretical sides together by demonstrating how creative experiences can be used for reflective inquiry. The resulting combination of these theories is used to develop a custom methodology for exploring content. This addresses my conceptual question of how digital media and critical exploration can function as a method of inquiry. I will discuss the detailed role of these theories within my custom method in chapter 4, but I’d like to provide a brief preview of how I am combining these ideas together.

Critical making and play come together to form critical exploration process, in which I employ determinate making and indeterminate play to gain new perspectives on concepts. Criticality in this process consists of reflective thought that allows me to
expand ideas, described by Ratto and Flanagan. A new perspective is supported further with the advantages of digital media, which allow for flexible forms that are not bound by the laws of the physical world. Digital continuums empower critical play processes by making them more efficient; more forms can be explored in less time, and unimaginable forms can be discovered through a spectrum of experimentation with realtime manipulations. Reversibility makes this process even more fluid because there is no risk of permanent operations, therefore rendering any possible manipulation a valid option with minimal consequences. Mental models are developed through indeterminate experimental play so that a material’s desired outcomes are more predictable. This can shift the critical exploration into a more determinate making process.

Reflection is key in this exploratory method; the criticality of digital exploration processes provides new ways of observing subjects of interest. This inspires me to develop new inquiry, which can expand into a network of related questions and information via rhizomatic thinking. Experiential learning best describes how inquiry and practice exist symbiotically in an iterative cycle of research. Digital exploration serves as a concrete experience, which will provide unique opportunities for reflective observation. This reflection generates new questions and meaning through the conceptualization phase, which can be mapped to more experiences. The generated

21 Flanagan, 6; Ratto, “Introduction,” 88.
inquiry is critically assessed by being filtered into more critical exploration experiences to repeat the cycle. Figure 2 illustrates how these theories overlap in the context of my method. The following chapter will review creative projects that initiated the application of these theories as well as inspired the construction of my method.

Figure 3. How I combine the theories to support my method of research.
Chapter 3. Concept Development

My research activities primarily fall into two different stages. The first stage consists of a researcher-facing method of inquiry employing the use of digital tools in acts of critical making and play to influence the development of new ideas, which I refer to as the internal process. The second stage, or external process, involves the design of a digital artifact embedded with the newly discovered ideas resulting from the internal process of exploration. This digital artifact is intended to disseminate new ideas externally to the public or viewer through the venue of exhibition. The internal and external processes reflect Ratto’s description of design-oriented research and research-oriented design respectively. The external process is still being developed as a future thread in this research; it is subservient to the internal process, which generates new ideas that fuel the designed artifact. In this document, I focus on the internal process.

The primary purpose of the internal process engages the designer and the tool as a method of inquiry, in order to synthesize new understandings surrounding the considered visual content. This method has emerged through each artifact that preceded my research with Thomas Cole’s *The Course of Empire* paintings. Each project emerged from different circumstances and took advantage of different digital tools to
sate my curiosity. These projects exist as experiments serving as crucial case studies to inform and develop my methodology. I will discuss how each project contributed to the developed method of inquiry, which is applied to the Thomas Cole research. I will also illustrate my conception of how the method progresses after each project, what elements it includes, and how it continues to evolve.

The information that I discover in the internal process is rooted in critical making, critical play, secondary research of the painting, and my own visual literacy and experience as an observer. I am not simply relaying preexisting history and analysis of the paintings found in written text, but rather creating my own informed interpretation through a process of critical exploration. Each proceeding project provided a unique opportunity for new observations and a wide potential for exploration of concepts; I uncover information that can function as conceptual support to develop new knowledge. However, the concluding insight in each project is always internally synthesized.

_Oath of the Horatii 3D Reconstruction_

The first influential experiment in my internal process was a creative project that dealt with Jacques Louis David’s neoclassical painting, _Oath of the Horatii_22. I

approached this project with a genuine curiosity surrounding virtual reality technology and 3D media. The tool of VR drove my curiosity and inspired me to develop questions surrounding the relationship between two-dimensional images with perceived realism, 3D digital media, and immersive environments. The result was processes of critical exploration with digital tools, which inspired new ways of thinking about David’s work as well as new ways of observing it. The process of exploration was indeed more valuable than the resulting artifact, which is representative of Ratto’s critical making theory.

This project sparked my interest in theories of critical making/play and digital craft, which are reviewed in chapter 2. I realized that a digital tool could provide a new way of observing, but also make the critical exploration process more fluid with realtime manipulations. The *Oath of the Horatii* project was a blended mix of both critical making and critical play. There were moments of determinate making, in which I had a preconceived idea of what I was attempting to create. This is evident when I pose figures and reconstruct the space’s geometry. There were also moments of indeterminate play, in which I experimented with the possible manipulations to observe potential outcomes. I did not necessarily know what I was creating in these moments but rather played with possible forms. This is evident when playing with the architectural elements that are not observable in David’s painting, like the height of a ceiling or depth of the space.
I started to consider how critical making processes combined with digital tools generated new questions, which could be tested by using playful manipulations of the material. Digital craft theory was also an initiated curiosity through this project. Realtime operations provided a continuum, through which I could quickly discover forms without having to preconceive them. In addition to these theories, I also began to think about how the actions in my process progressed. I noticed significant moments of choosing what tool to work with, what painting to observe, and how questions emerged. Throughout the review of this project, I will describe how specific moments birthed interest in theory and process structure.

In the initial conception of this project, I really wanted to see what might happen if I reconstructed a painting into a 3D immersive space that I could virtually occupy. With this experimental agenda, I had chosen a tool but needed to find a painting with content fitting to a set of observation criteria. I chose *Oath of the Horatii* because my familiarity with its narrative and compositional elements appraised it to fit that criterion.
David’s painting had relatively hermetic space, minimal figures, and clear linear perspective. Hermetic space avoids extensive asset creation and spatial proportion estimation when creating a 3D virtual environment. I wanted minimal figures for similar asset efficiency goals as well as to allow for an easier analysis of space. Too many figures might occlude key environmental features that expose linear perspective. Lastly, linear perspective had to be present, as this was the primary way that I could estimate dimensions of the space. *Oath of the Horatii* possessed all three of these criteria and proved a top candidate to minimalize complications in the translation of illusory 2D space into virtual 3D space. This activity of selecting the painting was purely driven by the choice of digital tool to explore with.

Virtual reality was appealing to me because it offered an opportunity to observe something I was so familiar through a new lens. As a digital artist, I cannot help but
imagine what the space in *Oath of the Horatii* might look like as an immersive environment viewable in 360-degrees. I was inspired to visualize the entire environment and create my own content that fills in the spatial gaps not described in David’s original work. The cropping of David’s image excludes where the scene is situated, if there is a ceiling, what the fourth wall might portray, and if there are any other figures spectating the event. To imagine this space as a 360-degree environment, these missing elements have to be designed and implemented to make sense with David’s content. As I quickly realized that my contribution would greatly outweigh David’s original content if imagined as a spherical environment, I shifted focus to only construct what he himself had visualized. This direction became an open goal to simply test what might happen when we viewed the painting as an image versus viewing a virtual reality environment that served as a reconstruction of the painting’s illusory space. If we experienced the VR space, would that change the way we look at and imagine the original image? What began as a flexible “What if?” ended up birthing my realization of the power of critical making and play.

With my open goal of reconstructing the painting’s space into a 3D environment, I began the creative process with a number of digital tools. To start, I used Adobe Photoshop to examine the linear perspective of the painting. This allowed me to take a 2D approach to extracting surface measurements that could be easily translated into 3D space. I had adept experience level with this software and relied on my knowledge of the advantages it offered to achieve this.
One of those advantages was a tool called “vanishing point filter,” which let me construct and measure a sort of “room” that mimicked the linear perspective of the painting. A significant advantage of using this tool was that I could measure distances in the Z axis, which extended deep into space. By establishing a unit that is based on the average height of a male figure, I found the dimensions of David’s entire visible three-dimensional space in proportion to the human figures. This provided me with a template of dimensions to use when constructing the geometry of the space in 3D. This moment inspired me to recognize how digital media could provide observations that are not possible with the naked eye when viewing the flat image. For example, I could
observe that the scene is actually deeper than wide, which is difficult to estimate with the original image and the naked eye.

From these measured dimensions, I participated in a determinate making process. By remaining critical and reflective of my making, I generated new questions. One example of this is determining the height and depth of David’s space. During these moments, I did not have reliable information to make a determinate decision in the making process. This lack of information generated questions focused on the unseen elements of the space and inspired me to consider them more closely. I turned experimental play to test potential qualities of these unseen elements in an indeterminate process. I did not have a destination in the process; I was simply playing with manipulations to discover what might make sense. The realtime transformations functioned as a digital continuum by making this experimental process efficient and primed for discovery. I did not have to preconceive the result of an operation, only manipulate the material to discover possibilities.

After I created the space, I began to pose the figures. In this determinate making process, I encountered difficulties matching the 3D figures to their depicted pose in David’s painting. I compared my proportional 3D figures to their painted counterparts in David’s image to find discrepancies between the two. The most significant example is the middle male wrapping his arm around the front male. The middle male’s arm in the 3D model was not long enough to reach the center of the front male’s back as depicted in the painting. Instead of ignoring the oddity and accepting it as a common discrepancy,
I paused a moment to reflect and take a closer look. During this reflection, I found myself examining the limbs of other figures including the front male’s raised arm and the front female’s draping arm. By using a combination of the Photoshop tools and the 3D models in comparison to the painting, I engaged in critical play to experiment with the virtual figures and their relationship to David’s image. I concluded that the proportions of David’s figures in the painting are exaggerated and manipulated. The most dramatic manipulation was the front female's arm; After more investigation I found it to be longer than the arm of a six-foot male. Figures 5 and 6 feature the process of experimenting with the software to investigate proportions.

Figure 6. The middle male in Oath of the Horatii being posed as a 3D model to match David’s image. The arm is not long enough to reach the middle of the back.
Figure 7. Using the vanishing point filter to measure the front female’s arm. It is nearly 0.8 meters long.

Since I was familiar with this painting’s narrative, I constructed some meaning from these odd discoveries. I concluded that, even though it was physically impossible, David posed the front male in this specific way to emphasize the comradery between the males, who are brothers going to battle. The woman’s long arm is perhaps meant to exaggerate her limp expression of grief; as a sister to the Horatii and wife of their opponent, she will lose a loved one no matter the outcome. These observations made
me more aware of how David employs technical visual manipulations, noticeable or not, as agents in the portrayal of the narrative. The most significant part of this process was that I would not have asked or investigated these questions were it not for the digital approach to observing these formal elements.

The resulting artifact of this process was less significant that I had planned. It was, in fact, the process that proved the most interesting. I was left with a greater awareness of the formal elements by observing them in an unconventional way. As an experienced art viewer, I used these discoveries to create a deeper understanding of how David is using the formal elements to serve the composition, narrative, mood, and flow of the image. I acquired a more profound appreciation and informed interpretation of the image, which was not as prominent before I created the artifact. Critical exploration involving a combination of critical making and play was a significant contributor to this process. Because of the digital approach of virtual 3D media, my questions and observations were centered on unconventional approaches to viewing the painting.

Digital media were an essential part of this process. It allows me to quickly and efficiently model this experiment within a flexible and adaptive progression of manipulations. Virtual human models allowed for any number and magnitude of reversible actions that would confidently stay in place for comparison with an image. To do this in real life with live models would prove a difficult and timely task. The virtual figures, although in correct proportions, allowed for manipulations that are not
physically possible with an intact human body. I could use the virtual puppet to directly observe what proportions and bodily limitations had to be broken for David’s poses to be matched. This advantage gave me an interesting power of insight into the figures in David’s work. There is simply no other way to know how a volumetric human body would be posed in his scene without injury or severe manipulation. Even using a flexible physical material would have its limitations and prove costly. Space manipulations were similarly advantageous with digital tools. Being able to quickly test different possibilities of the architecture proved very useful with within a digital continuum. I would have to use physical materials in a slow trial and error process to achieve this otherwise. With these advantages, I felt that I was seeing information that was simply not possible, or at least incredibly difficult, to reveal with physical tools.

In addition to critical exploration and digital tools, another concept that emerged from this experiment was iterative exploration. Certain moments, like the male’s arm discrepancy, inspired me to pause my production and branch off to explore a small pocket of inquiry. I started to consider if my process was a linear production path or more of a series of cyclical tests returning me to various parts of the process. At this point, I had a rough idea of how my process was progressing. Below is a graphic that illustrates this initial understanding.
Figure 8. Initial understanding of process after Horatii project
Relative Reality

A proceeding project to the Oath of the Horatii 3D Reconstruction was a project I dubbed “Relative Reality.” I collaborated with Alice Grishchenko to embark on another journey of making. This project examined M.C. Escher’s lithograph, *Relativity*23.

![Image of M.C. Escher's Relativity](image)

Figure 9. M.C. Escher, *Relativity*, 1953.

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Although I was familiar with the popular imagery of this work, I was less knowledgeable about any concepts, themes, or narrative present in the image compared to my understanding of Oath of the Horatii. I could gather that themes of perspective and consideration of spatial orientation were there, but my understanding did not surpass this abstract interpretation. I wanted to use this opportunity to explore the abstract concepts with digital tools. Instead of reviewing literature to relay preexisting information through a digital artifact, I chose to explore how I could express my own interpretation through making. Knowing that the Oath of the Horatii 3D Reconstruction favored process, I was prepared for critical making to have a role in this project as well. I hypothesized that my lack of detailed knowledge of Escher’s work might be resolved through critical making.

This second project not only strengthened my understanding of how critical exploration could work with digital tools but it also further developed the progression of my process. Instead of starting with a digital tool, I started with a painting. The criteria were not based on a production process that fit the tool but rather based on specific observations that Alice and I were interested in. The idea of mental modeling, a predictive state of anticipating the outcomes of operations, was introduced in this project. I developed specific curiosities in Escher’s work because I was imagining them through the lens of digital media. What playful mechanics could reflect the abstract concepts present in Escher’s work? How could his ideas be experienced through action? How would the space look from the different perspectives of the figures? What might
an expansion of the space into an exterior look like? I ask these questions specifically because the affordance of the digital medium allows for me to consider space beyond what a flat static image can provide. By imagining the scene in different digital forms, like interactive media, animation, or immersive environments, I developed a set of observational criteria that drove the decision of what tool to use.

The conceptual content of Escher’s work drove the curiosity in this project, compared to the digital tool of VR driving the curiosity in Oath of the Horatii. With our curiosity centered on the mind-boggling space, multiple viewing orientations, and concepts of perspective, we chose to experiment how action through the mechanics of interactivity within a virtual 3D world could serve as a way of experiencing Escher’s artwork. The observational criteria suggested that we needed a navigable 3D space, in which we could interact with and exit into an exterior world not depicted by Escher. This resulted in a nearly identical digital tool choice as the Oath of the Horatii 3D Reconstruction project but was chosen based on the curiosity of the painting’s concepts. We designed a game-like experience allowing a user to step inside a 3D reproduction of the space with VR and explore the spatial phenomena and considerations of orientation that Escher presents. This employed the digital tools of 3D media, interactive media, and the Oculus Rift virtual reality hardware.
This process began as determinate critical making. Alice and I had a preconceived idea of what we wanted to make, which was initially based on Escher’s original content. This was quite similar to the start of the Oath of the Horatii project, based on David’s original content. However, I decided to tackle the idea of designing my own content to mesh with the existing, rather than only reconstruct the artist’s original. This making process again generated new questions; This occurred primarily when facing design decisions in the making process that could not be driven by Escher’s original content. One of those moments was when we wanted to see what it was like to explore the exterior world that Escher hints to in his image. There are several arches and doorways that feature an exterior world in every “gravity plane” or orientation in
Escher’s space. Due to the affordance of virtual 3D media, I began to not only think about where these doorways might lead to, but I could actually create a response to that curiosity. This process was more involved with critical making versus play. The making process coupled with a digital perspective inspired new questions and therefore new ideas that would not have been addressed before.

I addressed these new questions by expanding upon Escher’s ideas and inserting my own cohesive content that made sense. This step forced me to evaluate what ideas the artist might be projecting and develop what they meant to me. After this reflection, I created material that complemented Escher’s original content; this new content introduced an environment in which a participant could explore Escher’s concepts under the influence of my own interpretation. This content “filled in the gaps,” of what we can speculate but never observe in Escher’s image: that which is beyond the frame. The result of this interpretive insertion was a natural exterior world that held different entrance locations correlating to the different doorways in Escher’s image. Passing through the arch featuring Echer’s couple in the dining setting would transport someone to one part of the exterior world while the arch with the pine tree in Escher’s image would lead to another location in the same exterior world. The intent was that this represented one’s internal thoughts. If we explored the outside world, we would emerge back into Escher’s shared interior room at a new location and with a new perspective. Figures 11-13 feature the designed exterior world and the archway portals.
Figure 11. The exterior world to which all archways in Escher’s space lead.

Figure 12. An archway translated from one of Escher’s depicted in *Relativity*. 
The critical making process and digital approach inspired me to examine Escher’s work in an unconventional way. I interpreted Escher’s interior world to represent a social space which we all inhabit. The overarching concept of this choice was meant to suggest that the more we explore our internal conscience, the better perspective and consideration we have for the different inhabitants of our communal world. This activity fell in the category of critical making, as the act of determinate making inspired a better insight into the image.

In addition to critical making, this work began to inspired consideration of the role of literature review. One of the shortcomings of this project was that the content was driven purely by my own interpretation. I never reviewed literature that would have
helped develop a more informed interpretation. In the Oath of the Horatii 3D Reconstruction process, I never considered much literature review because I was already so familiar with the narrative and ideas present in David’s image. I pulled from my prior knowledge to make informed inferences when a situation for interpretation presented itself. However, I did not possess this expertise when it came to Escher’s work. I did gain a deeper appreciation of Escher’s work, but I never achieved a feeling of truly knowing that what I made was an accurate reflection of the concepts that he was projecting. I started to consider where this review might play a role in the internal process and what situations might warrant it to occur. The process flow began to shift and I evolved my understanding. Figure 14 features my understanding of the process after the Relative Realty project.
Figure 14. New revision of process flow after Relative Reality project.
After acknowledging that literature review was something that needed to be part of my process, I developed a greater idea of how it might play a role. A fantastic case study created by Pieter van Hyustee Film and NTR provided an opportunity to explore how more explicit external information could become part of my internal process. Their work, dubbed, “Jheronimus Bosch, The Garden of Earthly Delights,” features an interactive website to explore Bosch’s renown triptych painting, *The Garden of Earthly Delights*.

The site features a digital image of the painting with mechanics of zooming in on intimate details. The most significant addition to the work is that of sound. Atmospheric audio and spatialized sounds that offer another level of sensory experience when exploring specific areas of the paintings. When zooming in on the fountain in the left panel’s scene of paradise, we can hear running water, heavenly harps, and animal calls. On the other hand, we hear disturbing music, furnaces, and shouts of agony from the scene of hell on the right panel. It also presents two states of interaction: a free exploration and a guided “tour.” The free exploration allows a user to move around the painting freely with location and magnification control to experience the imagery and

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sounds as they wish. The guided tour substitutes that freedom with a predetermined path of exploration, accompanied by a narrating voice over audio. This audio describes the scene, alludes to the sounds one might hear, and additional information that cannot be gathered from the sole visual and auditory experience in the free exploration.

![The Bosch bird](image)

**Figure 15.** Guided text and audio while zooming in on a detail of Bosch’s painting.

After interacting in both modes of this fantastic tool, I began to realize that there is a plethora of information beyond what I see in the images. This is information that can greatly influence my understanding to create a more informed interpretation. Previously, I would only rely on my prior knowledge or ability to interpret a new image when synthesizing meaning in my process. Even if I had previous knowledge, or possessed a veteran capacity to cold critique new images, there is still so much
information that I could be missing. My experience with the interactive site helped me to think about how this information needs to be involved in the process, but it also served as an example as to when it should be involved.

In addition to literature review, I developed my understanding of critical play with this case study. My previous Oath of the Horatii 3D Reconstruction project introduced this topic, but it was driven by making as a subservient informer. The mechanics of play emerged through new questions generated by making processes. However, with the Bosch site, I used preconstructed mechanics that were not of my own device. I discovered that my play with these mechanics drove my curiosity about the painting’s content. I started to realize that critical play can become an equally powerful generator of new questions focused on the painting without a reliance on determinate making. This occurred in a very similar way to the critical making process generating questions in Oath of the Horatii 3D Reconstruction, but through pure experimental play versus making.

An example of this is most prominent in the free exploration mode of the website. Upon exploring the previously mentioned fountain in the heavenly scene in the left panel, I noticed sounds of birds. One of which, an owl hoot, stuck out as odd in the daylit scene. As if calling me closer, I zoomed in on the scene to get a closer look and find the visual counterpart to the odd sound. The mechanics of this play process directed the way that I observed the painting. This idea has become an extremely prominent advantage to my method of inquiry when using digital tools and their ability
to inspire a new way of experiencing and, in turn, understanding. After zooming in, I noticed a small icon that, when clicked, began an audio narration of that small portion of the painting with information I could not have inferred on my own.

Figure 16. Icons for more information on areas of Bosch’s painting in the free roam mode.
I learned that the owl, although nocturnal, is placed in the daylight scene not to symbolize a conventional representation of wisdom, but of evil watching over man. This information influenced my understanding of the imagery in ways I could not gather on my own. It also emerged from reactive questioning driven by play, rather than in a long process of thorough review of all information. With this tool, I could both generate new questions and gather information related to them at any moment of my choosing. This case study certainly helped progress my understanding of explicit information surrounding my questions, as well as how critical play can drive the internal process. Figure 17 features a final iteration of my understanding of the internal process flow after playing with the Bosch interactive. This iteration would continue to be revised into a much more complex series of actions in the method of inquiry.
Figure 17. Process flow incorporating more nonlinear progression.
Method Preconception

With these creative projects, I was able to form a foundation of the agents in my inquiry. I could gather contributing theories, actions of exploration, how they could become related, and how my understanding of the painting developed through them. The only problem remaining was figuring out how they progressed. Was my process linear? Was it perhaps cyclical, or iterative, or simultaneous? Was there any sense or order to my internal process? By now I had a rough idea of how the elements interacted, but it still needed some revisions.

From the topics inspired by each creative project, I began a list of “events.” These were simply things that had happened in my previous exploratory processes that contributed to my discovery and insight into the content. I knew there were events in which I began to generate new questions. I knew these questions were driven by creative or playful activities. I knew digital media greatly influenced these exploratory approaches. I knew that additional external information played a role. I began to see blocks of activity in my process; some things led to other events, some overlap, and some repeated sequences of events. From this loose template, I constructed my custom method of inquiry as a process of which the progression is undefined. I realized that each project, each act of exploration was an individual journey. Although driven by similar approaches with digital tools and creative processes, each endeavor is unique.
and calls for a flexible and reactive progression of events. The following chapter
describes my method of inquiry in detail through overviews and examples of the events
that construct it as well as potential patterns and relationships that can form in the
process.
Chapter 4. Process

Internal Method of Exploration

In this chapter, I review my custom process of making and play with digital tools as a method of inquiry into my curiosities of the five paintings in Thomas Cole’s *The Course of Empire* series. I present this process as an open methodology for using contemporary digital tools to critically explore research subjects. Through applications of said methodology on Cole’s paintings, I demonstrate how this process can function in a case study focused on fine arts. I will discuss elements of the method, their role, their progression, and relation to relevant theories. I want to note that this process is not linear; the following sections describe “events” that occur during this process. Some events progress in patterned sequences, while others bounce back and forth depending on the specific state of mind, the questions, and subject matter. The order of these events is listed in a general chronological order in the context of my research with *The Course of Empire*. Figure 18 illustrates the flow and relationship between the events in the method of inquiry.
Figure 18. Event progression in the internal process of exploration with digital tools.
Selecting Content

Figure 19. Detail of Initial block in method progression.

The initial event of exploration can be the most intimidating, yet exciting. It is completely open and up to me to choose what I’m genuinely interested in. Sometimes I have a passion for a specific work that drives the decision; I need and want to know more. For example, I have developed a personal desire to examine Botticelli paintings because I find them so incredibly enigmatic. There are other times in which something about the work simply strikes me and begins a chain reaction of questions and interests that beg to be investigated. This occurs when I view Remedios Varo work, as I tend to develop an interest in her consistent use of hermetic spaces. Each of her paintings is unique, yet they all carry a curious sense of space that inspires me to question its purpose and extrapolate it in my imagination. I refer to this type of selection process, which is rooted in the selected content’s ideas, as “content-centric.” The initial flow of the events in the initial block (figure 19) begins by curiosity surrounding content.
Digital tools and expertise can also begin this initial block of events. For example, during my *Oath of the Horatii* project, I held intentions to experiment with 3D media and paintings. I already chose a digital tool and developed a set of observational criteria. I specifically chose *Oath of the Horatii* because it had shallow space, clear linear perspective, minimal figures, clear lighting, and relatively simple colors/textures. All of these components influenced my decision to select it because they enabled a more efficient process of creating the 3D environment and met the observational criteria. This way of initializing a project I refer to as, “tool-centric.” The complex compositional decisions made by David did not drive my decision to select the work, but they were revealed in time and came into consideration nonetheless. Instead, the choice of the tool determined curiosities developed, criteria for observing, and the selection of the painting. It truly depends on what I am curious about. This will be discussed further in the Making and Play section.

In terms of the research with Thomas Cole’s work, I selected his series of paintings due to a number of reasons centered on the content of Cole’s work, rendering this application of the method to be content-centric. Firstly, I have not experimented with multiple paintings in my research projects before, only singular frames. This creates the challenge of comparison and relationships when reviewing multiple images. New meaning and narratives can emerge when two or more images and their prominent visual elements in the frame are juxtaposed in different ways. *The Course of Empire* provides me with five individual paintings and a virtually infinite number of ways they
can become juxtaposed to create new perspectives. Multiple images can also introduce a linear progression of viewing and a narrative that suggests the passing of time. Cole’s paintings are specifically suited for this as they communicate the development of civilization over an undefined, yet extensive amount of time. Upon closer examination, I found similarities between the first and last paintings, which mark the beginning and end of the linear progression of time within Cole’s series. This suggested a possibility of cyclical time, which carried an interesting potential to be revealed with digital tools that can afford an investigation and fluent communication of time.

Figure 20. Cole’s narrative present in The Course of Empire. From left to right: Savage State, The Pastoral State, Consummation of Empire, Destruction and Desolation.

Secondly, his work displays complex and dense visual content. All of Cole’s environments are heavily populated with natural, figural, and architectural content, which can provide a rich opportunity for investigation. When coupled with the capability to compare and create relationships with multiple images, these complex visuals can become clearer or even more complex depending on how they are arranged. Dense images also create an opportunity to zoom in and become intimate with details, as well
as to zoom out and take a macro view of those details situated in an entire visual work.

Being able to examine and understand small portions of content have potential to influence the understanding of content in other images. Again, the multiple images inflate advantageous qualities of these paintings.

Lastly, Cole’s work suggests a clear and provocative narrative. His images portraying the rise and fall of civilization are so beautifully descriptive, yet vague at the same time. His perspective at the time of creation is influenced by political turmoil in the United States. Even though Cole’s work was completed nearly two hundred years ago, I could not help but find some affinity with the ideas, anxiety, and unrest he was experiencing with the state of his government. With political conflict still present in the United States today, I anticipated a rich opportunity to bring out contemporary ideas in Cole’s work. My agenda begs to elucidate the story in multiple ways and possibly abstract ideas that are relatable to our current lives. This can be approached through the advantages of multiple images, time, and complex visuals in The Course of Empire.

At this point, I am unsure of what or how I will specifically investigate. This phase overlaps with the Active Looking and Forming Curiosities event. As this methodology develops further, it is likely that phases increasingly overlap and occur more simultaneously. I argue that Forming Curiosities and Selecting Content actually occur simultaneously. It is nearly impossible not to become curious about certain things when

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viewing the paintings; these form the basis of my intentions to investigate and can influence in the selection process. If I’m not curious about anything when selecting content, then why investigate at all?

**Active Looking & Forming Curiosities**

One of the most important aspects of this method is to be able to view the paintings through the eyes of a digital artist. I embrace and consider the affordance of a variety of digital tools that allow for experimentation with immersive spaces, movement, time, and interactivity. These elements that, as a digital artist, I am familiar with can offer and encourage an unconventional perspective when viewing and exploring paintings. With this perspective, I can begin to ask questions and think about visual content in ways that traditional fine arts may not address. What would this figure look like if it were a moving image? How would this space be organized if it were a fully immersive environment? In what ways could I interact and play with space and ideas in this painting? These are general common approaches to curiosities but are much more specific to each individual painting. In Oath of the Horatii, I had very specific curiosities about the space as a 3D environment. I was curious about the height of the ceiling, the depth of the space, where the light was let in, and what was beyond the furthest wall. These fell under a general category of curiosity about 3D space but became detailed questions when applied to the painting. Typically, the curiosities will begin by focusing
on formal elements of the painting, like space, composition, figures, narrative, and lighting. Imagining these elements of paintings through the lens of the wide breadth of digital media affordances is a promising and approach. By recontextualizing and reimagining the painting beyond what is visually present, new unconventional questions and curiosities can emerge to influence a deeper consideration of the work.

I start my exploration of Cole’s paintings by simply looking. If you remember, I chose these paintings because of their potential in multiple images, complex visuals, progression of time, and narrative. Naturally, I develop curiosities surrounding these appraisals. An additional element that I always observe in paintings is space. I typically evaluate the 3D nature of paintings if they suggest such illusory space, and because I am so attuned to 3D media and immersive environments, I cannot help but imagine the space in the paintings as such. With Cole’s work, I am struck with a similar curiosity about space, but not about the environmental or three-dimensionality of it. I am curious about the continuity of space. I rely on my visual literacy and experience of viewing paintings to pick up on certain details, like the mountain and body of water that occupies a consistent visual presence, to understand that the space depicted is meant to be the same space in all five paintings.
Because there are multiple paintings, I am less concerned about the 3D nature of any singular image, but rather how space functions as an agent of continuity. I become curious about the relationship between the depictions of the same space as it moves through each painting. This curiosity brings time into consideration as well; I compare how that space changes in the suggested passing of time and how that might help me understand what has occurred between images more so than within them.
The complex visuals build my interest in continuity and I develop a curiosity about the spatial placement of visual content among the paintings. One example of this is the observation of the hunter in *The Savage State*. His placement in the frame is near the elder man’s placement in *The Pastoral State* (figure 22). I begin to develop open questions about the relationship between select visual content in the paintings; this occurrence is heavily influenced by my understanding and mental modeling of digital tools that superimpose and manipulate opacity in images, allowing me to see two things simultaneously. I’ll discuss this digital affordance in the following event.
Figure 22. The proximity of hunter and elder in *The Savage State* (top) and *The Pastoral State* (bottom)
Because I consider the relationship between the paintings, I also consider the presence of linearity in the narrative. The order these paintings are intended to be viewed is quite clear with a basic understanding of history and the development of civilizations. Man starts as a primal being, develops, forms a pinnacle society, is destroyed, and ruins remain. However, I begin to question the linear narrative and ask if there is the possibility of a cycle; again, time and multiple images play a role developing this narrative curiosity. By imagining this series as a time-based video loop, I form curiosities surrounding the nature of the linear narrative and its alternation. Expanding upon this idea, I develop questions focused on new narratives that might present themselves if the paintings are read out of order. What if the first precedes the fourth? What happens if we switch back and forth between two paintings? I consider these open questions to be more aligned with curiosities, which serve as the foundation of my investigation of Cole’s work. Detailed questions will be discussed in the Generating Questions event.

Digital media inspires me to examine the paintings in a specific context and consider the abilities it could offer. It creates a context that generates initial curiosities, as well as provides a means to investigate them. Many of the curiosities are developed because of predictive modeling of potential digital tools (i.e. What if this were a video loop?). Choosing digital tools is another area that overlaps, happening semi-simultaneously with Active Looking & Forming Curiosities. Note in Figure 19 how mental modeling occurs in this overlap of the two events.
A conventional approach to research might turn to literature next to address these curiosities. There is a plethora of information that can be sifted through to answer the many questions that I generate while actively looking at Cole’s paintings. However, my method dives into making and play before any literature review. Generally speaking, I choose to challenge my conception and understanding of the meaning behind these curiosities through an exploratory process of making and play with digital tools. I prefer not to be influenced by external information at this point, but rather wish to generate my own pure questions that are born from the act of exploring with digital tools. In my experience, I’ve found that this process produces questions and investigatory approaches to the literature that are unconventional and possibly novel. In the Directed Literature Review event, I’ll discuss in detail an argument for this decision. With my curiosities in hand, it’s time to open them up and observe them with a new lens fueled by critical making and play.

**Selecting Digital Tools for Exploration**

This event is one of the most significant of the exploratory method. The right digital tool is the key to generating new questions, new observations, and ultimately new insights. It is possible for this event to occur during the Forming Curiosities and even the Selecting Content events, hence the overlap in figure 19. My idea of the digital tool in use may not be entirely developed when it does occur simultaneously, but it
forms a relationship with the previously described events. The way I select the content and recognize potential curiosities can be greatly influenced by the predictive mental models of potential digital tools I am familiar with. There exists a constant mental flow through Selecting Content, Forming Curiosities, and Selecting Digital Tools. This initial block of effort generally precedes the majority of events in the methodology; however, there is rarely any linearity in their occurrence. Individually, they may repeat, cycle, or occur simultaneously. The core of selecting a digital tool to explore with relies on predictive mental models, the affordance of the medium, what is to be observed, and the method of observation. Refer to chapter 2 to review Malcolm McCullough’s discussion on mental models of digital tools and how we can expertly develop predictive states of mind within design worlds.

In content-centric initiation, the selection of the digital tool primarily depends on the curiosities that have formed, mainly the “what” and “how”. What am I going to be observing and how should I observe it? If the primary curiosity surrounds questions of space, I must select an appropriate tool and design world that best creates an opportunity to examine the topic of space more closely. Again, this heavily relies on mental models; it is the only way I can know if the tool is appropriate or not without a tedious trial and error process. With the example of spatial curiosity, animation would not be an appropriate design world to begin with because its possibilities focus on motion. It is unlikely to provide an opportunity to specifically observe space. The “what” that is to be observed cannot even be observed in this example.
The tool selection also depends on how I am going to observe. Perhaps I am going to observe space by evaluating its construction as a 3D environment. Using digital painting as a tool to examine space through 3D reconstructions may not be the most appropriate selection in this case. Technically we can observe an illusion of 3D space using digital painting; we could render a convincing environment and manipulate its dimensions to test ideas. However, it does not possess the affordance to produce dynamic 3D forms with an efficient continuum of manipulation. Each manipulation would require painstaking work and require a predetermined visualization of that space before it can be executed. As we can see, an understanding of affordances and design worlds is essential to constructing mental models, which I discuss in chapter 2; these predictive models elucidate how the procedures and creative effort might play out so we can find the most efficient and opportune methods of observing specific content.

In my thesis artifact working with Cole’s paintings, I choose to work with digital image editing software. Remember that I am interested in observing the compositional elements in the context of continuity between the paintings; this is what I want to observe. This tool is appropriate for my specific curiosities because I am focusing on the two-dimensional formal elements of the paintings. There is no need to model out the 3D space suggested in the paintings; I can mentally model this and know that the possibilities of 3D media in the design world of virtual environments will not inform me about composition, continuity, and visual content on flat image space in an appropriate or efficient way. Image manipulation software will allow me to properly observe what I
am curious about in Cole’s paintings. What I need to decide is how to observe them. I have worked a great deal with image manipulation and understand what it can and cannot do. A particular affordance of interest to me is its ability to layer multiple images onto one another and manipulate their opacity. Using these mechanics, I set up a custom design world for myself, in which I embrace the many possibilities of visualizations that can emerge, serving as my continuum of manipulation. By mentally modeling the procedure, I can predict that manipulating the images in Adobe Photoshop will reveal some of the connections that I am curious about, like the spatial placement and comparison of visual elements through time. This determines how I will observe the compositional elements in the context of continuity, as previously mentioned. Now that the tool is selected, it’s time to make and play.

Making and Play

Figure 23. Details of the exploration block in the method progression.
This event is arguably the largest chunk of active discovery in the exploratory method. It is comprised of two activities of creating artifacts and interacting with artifacts, which translate to making and play respectively. In chapter 2, I reviewed how making and play can be merged in a similar process, distinguished by determinately and indeterminately desired results. Either of these activities could generate questions. Typically, making processes generate new questions while play allows me to investigate and experiment with them further. The most significant part that runs throughout making and play is that I remain critical and reflective at all times. Indeed, making and play are enjoyable activities; however, without reflection, it is nearly impossible to develop new questions or understandings.

This event overlaps with Selecting a Digital Tool to some extent. Granted, it sounds difficult to imagine making anything before I have chosen a tool to begin with. However, the selection process can be an ongoing one. Making and play are not only valuable agents in an effort to observe the content, but they are essential to developing mental models. I can acquire a better feel for the material/tool/design world that has been tentatively selected by engaging in experimental play. It is essential to know how the digital tool will function in the exploration process for it to be used as a proper lens through which to observe the content in question. Unless one is an expert on a specific tool, I highly recommend that experimentation and prototyping be executed in order to validate that the selection is, in fact, an appropriate tool for the job at hand.
Occasionally the selected tool simply does not allow for the proper observation of what I want, and I must repeat this event after some making and play to confirm that something needs to be changed.

In addition to informing and developing mental models, making and play inform my observational goals. When the mental model is developed, I can predict how certain digital tools can unfold within a design world to expand the method of observation. This is an iterative process. Sometimes the Making and Play event starts here if I am familiar with the tool and can predict proper mental models. Other times, there needs to be some making and play to develop an understanding of the medium first and how it might offer a new perspective and way of observing the content. From here, the utility of the tool is revised, affecting what is being made. Using making and play to develop a mental model and observe the content are simultaneous and reoccurring.

The resulting artifact from making can also be an agent in the observation process. Making an artifact can raise certain questions, and the artifact itself further refines the questions or generates more. The resulting artifact could be interactive and provoke play as well. It is important to be aware of both the process journey and the destination in their contribution to generating and refining questions.

I primarily engage in play during my exploration of Cole’s paintings. Knowing that I am working with digital imaging software, I want to play with the mechanics it can offer to see what new images and observations it offers. Even though I am “making” new images when I play with merging and superimposing different paintings, I do not
consider these to be artifacts; they are merely possibilities in the design world’s continuum that serve the purpose of observing in a specific way, therefore I describe my process in this event as mostly indeterminate play. My exploration is mostly indeterminate because I do not have a preconceived idea of the visualization I am trying to achieve. Instead, I am experimenting with mechanics to discover a form that sparks inquiry. It is the journey of the process that is my primary concern at this point, not things that I produce. Even though I have a strong mental model to work from with digital imaging, I still want to test how it can work as an observational tool with *The Course of Empire* content. I take a moment to employ play to get a quick understanding of how image manipulation will work in the design world of Photoshop with these specific paintings. Figure 24 features the different layers of images and their manipulated opacity in the Photoshop prototype.
I start by importing all the painting images as separate layers in Photoshop and making sure they all fit on the same scale and orientation on the canvas. I focus on two paintings, the first of interest being *The Savage State* and *Destruction*. I move those layers so that one is right on top of the other. Then, I adjust the opacity of the top layer to let the bottom layer show through. This lets me see the content of both paintings at the same time within the same frame. I can observe how they align with composition and visual content. I can notice now that my mental model is accurate. I start to observe similarities and sophisticated reference among the two images. As the last test, I import an image of the golden spiral as a layer and reorient it in different ways to see how the paintings’ compositions are formatted. It reveals a great deal of genius behind their
construction and I become enlightened of Cole’s meticulous decisions. This works wonderfully as a quick test, but it isn’t very efficient. I have to perform extra operations to work with some of the mechanics like adjusting opacity, reorienting layers, and moving layers around. Now that I know my mental model is accurate, I can build a custom tool that allows for these playful mechanics to flow more efficiently.

This act demonstrates the iterative and simultaneous nature of play. As stated above, I am analyzing both the behavior of the tool for my mental model as well as the efficacy of its ability to offer new observations. I now revise the application of my tool to create a more efficient way of observing. I use Unity 3D to design a simple application that mimics the mechanics I was using in Photoshop. I can adjust opacity, reorder layers, incorporate compositional notations, and reorient those notations all with quick realtime actions. With Photoshop, I can to type a value or adjust a slider to an estimated position and let the software render it before I could see the result. With my custom tool, the results are realtime and easier to set without the trouble of guessing in a trial and error situation. This embodies the digital advantage of a continuum of design states. I can discover untried manipulations without having to imagine them first. The custom interactive form also possesses a greater potential to expand and incorporate more mechanics as my process of exploration is refined. This tool serves as my primary “toy” that I can play with to make new observations that address my curiosities. Through this play, I can develop more detailed questions about specifically interesting things, which I had not noticed before. Figure 25 features the completed custom interactive tool.
Figure 25. The completed interactive tool featuring opacity manipulation and composition visualization layers.

**Generating Questions**

In this event, I focus on reflection and criticality. Questions are generated simultaneously with the making and play process. It is a difficult task to remain both creative and critical at the same time, but this produces insightful results when performed well. This process of generating questions is inspired by David Kolb’s experiential learning theory, which consists of four stages in a cyclical pattern. My event of generating questions derive from Kolb’s Reflective Observation and Abstract Conceptualization stages.
The act of play with the digital tool constitutes a concrete experience. I engage with a stimulus in the experience and commit to thoughtful reflection, which is a shared concept between experiential learning and critical making practice. Without thoughtful reflection, new inquiry has no foundation to emerge from. The observations in this process are not simplistic or conventional in the context of viewing paintings. The very method of experience with digital tools produces new observations that were not present or possible before. If anything, this novel experience demands contemplative reflection. Moving into Abstract Conceptualization, the new observation is “assimilated,” as Kolb says. In my method, the new observation is compared with a preexisting model of expectations, typically focused on the artifact or content being examined. Where discrepancies or gaps occur between the two, questions burst forth. New inquiry is generated from the transformation of new observations into new concepts, driven by a comparative analysis of prior knowledge and new information.

In my work with Cole’s paintings, new questions are generated when I observe new things with the interactive tool. Introducing compositional icons like the golden spiral, and mechanics like opacity adjustment, provide an opportunity to make new observations. In the digital tool, I make the golden spiral visible while lowering opacity on *The Savage State* layered on top of *Destruction* (see Figure 25). I observe that the two paintings have a deep compositional similarity. I identify that this similarity is due to their common use of the golden spiral, which is visibly confirmed with the compositional layer mechanics in the interactive tool. I observe that the spiral fits into Cole’s
compositions perfectly, following visual elements that contribute to both of their narratives. When I process this information, I reflect upon the gap between my previous expectation and new observation of the compositional relationship. Before any making or play, I previously acknowledged a general similarity between the two paintings; however, I realized that I failed to recognize how the golden spiral connects the paintings’ compositions once I compared my new observation with my previous understanding of their construction.

This generates new inquiry surrounding the golden spiral’s continuity between the paintings. I now ask, “How are the paintings related through their compositional structure?” I would not have asked this question before having the playful experience in the digital tool. The new question derives from the situation the digital play has presented along with my deliberate reflection on the new observations I make. Following Kolb’s cycle, these questions are transformed into another experiment with play. I chase my new inquiry surrounding compositional relationships by testing my question on the other paintings, thus repeating the cycle with Active Experimentation and creating a new experience.

As the cycle repeats, more questions arise and become more specific as the process progresses into more of a refined spiral, as Kolb describes. These actions can be categorized in the Refined Inquiry and Refined Play events, which are discussed in

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27 McLeod.
following sections. To provide a brief preview, I repeat this cycle when I make a new observation comparing compositional and narrative elements in *The Consummation of Empire* and *Destruction*. With the digital tool, I notice how the paintings’ composition juxtaposes the religious statue in *The Consummation of Empire* with the military statue in *Destruction*. This additional novel observation generates a more refined question surrounding the agency of continuity in the paintings through composition. I ask, “Why are the statues compositionally related?” Again, this is a new and specific question I would not have asked outside of the digital experience of play.

This is not to say that new questions cannot occur before exploring with digital tools. Keep in mind that these events may reoccur and unfold simultaneously with others. Inquiry can occur before, during, and after digital exploration. Sometimes my curiosities are specific enough that I have predetermined questions before any play or making happens. I attribute this to my strong mental model’s ability to help predict what type of new observations could emerge. As I mentioned before, my perspective as a digital artist provides an unconventional approach to imagining and interpreting paintings. This, coupled with my veteran experience with viewing artwork, gives a bit of a preview of new questions that might arise in critical processes with digital media. I do want to note that the way these questions develop with influence from rhizomatic thinking. It is rarely one simple question that is developed from digital observations, but rather a small network of related question. These subsidiary questions can be pulled out

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and branch into more developed questions, resulting in Refined Inquiry. Figure 26 illustrates this occurrence.

Figure 26. Rhizomes in inquiry generation.

One of the challenges within this method of inquiry is asking myself, “am I being critical enough?” Sometimes I can form new knowledge within multiple cycles of experiential learning during making and play experiences. Other times, I can quickly pull from my prior knowledge to make informed conclusions. However, there are many instances in which the digital experiences of making and play cannot answer the questions asking, “why?” The previous question focusing on the relationship between the statues is an example. This is something that I cannot answer through more playful experiences with my tool or by pulling from my prior knowledge. When I hit this wall, I cannot simply give up and assign it as some mystery. This calls for additional methods of investigation through the work of others.
Figure 27. Details of the external information block in the method progression.

In this event, inquiry is further pursued by reviewing literature that surrounds new questions. Literature review could be challenged in this method to suggest that it should occur before any making or play experiences. Wouldn’t it make more sense to know this wealth of information beforehand, so that one can successfully answer any questions that arise? In this method, I argue that gathering preconceptions about the paintings before exploring can hinder the questioning process. If I develop an expertise in a painting through literature before any making or play, it might influence the way I observe during that exploratory process. This is not to say new observations will not be made, but the perspective would be influenced by external information versus the digitally specific exploratory process. The questions that derive from the making and
play process may also lack authenticity. Having adept prior knowledge could potentially generate contrived questions that are constructed in a way that can be answered immediately with existing knowledge. By refraining from literature until questions are generated, the inquiry becomes directly born from and genuine to the digital exploration process. When I approach the paintings, I want to remain a little bit in the dark. It fuels my curiosities and produces inquiry that feels completely novel. I can ask questions in a way that is true to my personal process of engagement without being bound by written texts’ suggestions of how or what I should be viewing. This external information is certainly examined, but at the right time.

As stated before, I pursue literature review when I have hit a “wall,” of criticality. The making and play can no longer answer my questions or the questions have become specific enough that I need to seek out more concrete information to resolve the inquiry. Since the question is specific enough, it calls for a directed review versus a broad collection of all literature. This proves to be a more efficient way to pursue my inquiry, in which only relevant information is gathered, yet still in a broad array.

Previously I discussed a refinement of my question surrounding The Consummation of Empire and Destruction and their compositional elements. I asked, “Why are the statues compositionally related?” I turn to literature now to search for specific information related to this inquiry. I do not need to review all of the information that exists on Thomas Cole and his series at this moment. A very useful site, ExploreThomasCole.org, served as an excellent way to get a quick overview of the things
I am searching for. Their Interactive Tour tool lets me acquire more information on
different visual parts of the paintings. I can go directly to painting I am inquiring into,
and click on visual elements to get related information. This tool informs me that the
statue is modeled after Athena, a symbol of war and victory. I can also click on the
military statue from Destruction to learn that it is modeled after a real sculpture in the
Louvre28. The site also provides me with additional resources that contributed to the
summaries, including Cole’s own journals.

28 Elizabeth Gardner and Karen Lucic, “The Course of Empire: The Destruction of Empire,” Explore
Figure 28. The Interactive Tour feature on the Explore Thomas Cole website.
This information can then culminate in a more informed understanding of the relationship between the two statues. With my prior observations, I make a conclusion that Cole is referencing how the society’s religious icon representing war is manifested into reality as the very thing it stands for in an ironic manner. Athena’s placement in the frame is juxtaposed with the military statue in the following Destruction painting through careful composition to create a powerful statement. My curiosity, new observation, and criticality have led me to an insight that I would have most likely never considered or developed outside a process of play with digital tools.

At this point, I am generating my own interpretation and information. I am not merely taking myself through a quick history lesson to become more educated on the paintings. I am synthesizing meaning based on my new observations, new questions, and what current information has been gathered. As the researcher, I bring all of these things together to start constructing a new understanding of the painting rooted in my iterative exploration with making, play, and review. The conclusion above was not something I gathered from someone else’s research; it is meaning constructed by me, all influenced by the digital tool, my process, and the work of others.

This literature review may resolve some questions, but it can also generate even more questions. This occurrence overlaps with events of Refined Inquiry, Rhizomatic Review, and Refined Play. It calls for more investigatory action through evolving questions, examining related information in literature, and directed play with a more informed perspective.
This event draws inspiration from Deleuze Guattari’s writing on rhizomatic thinking, reviewed in chapter 2. The investigatory path of learning is never a linear from inquiry origin to a destination of understanding. It is a branching journey of twists and turns that are all built on one another and interrelate as the body of knowledge.

In terms of my own method, I take a rhizomatic approach to reviewing the literature. As mentioned, sometimes newly acquired information from Directed Literature Review will result in more questions. My participation in the Directed Literature Review and Rhizomatic Review is not a continuous block of action. I constantly bounce back and forth to more refined inquiry and exploration. The network of information is developed in spurts, versus all at once. Depending on the question, I may return to play and progress through other events before returning to literature again. Other times it calls for an examination of additional literature that is related to the information that incited more inquiry. Sometimes there is a general curiosity at a low unprocessed level when reviewing literature. It may inspire me to branch off and
say, “I wonder what more is written on this?” The result is a network of information that is all related to the “root,” or origin of inquiry, and other nodes of discovery that results from iterations of Rhizomatic Review and Directed Literature Review. This further supports the argument to refrain from literature review until substantial inquiry has been generated. Instead of a broad overview of literature that is cut apart individually to fit into an inquisition, a lineage of related nodes of information work together to trace back, relate, and develop an understanding that unfolds a dense inquiry.

After finding information in the Interactive Tour tool on the Explore Thomas Cole site, I begin to become more curious about the military statue in *Destruction* and its modeling after a specific sculpture, which is titled *Borghese Gladiator*. I generally want to know a bit more about this sculpture and if there is anything significant about its reference. A new rhizome, or node of exploration, now extends from my initial review of the literature to address a new pocket of information. Upon a broad review, I found that the sculpture was collected by the Italian Borghese family of the 15th century. However, it was created around 100 B.C. The sculpture has a certain amount of controversy over who was responsible for creating it; it features a carved signature of one person, but experts attribute specific visual style to a different well-known sculptor of that time. The artwork itself has an embedded argument over who truly has the right to claim this

29 Gardner and Lucic, “The Course of Empire.”
work as their own. When contextualized within Cole’s *Destruction* painting, this brilliant reference contributes to the image’s theme of conflict and conquest. I felt as if Cole was smirking at me behind the painting as I came to this conclusion, for he too signs his name on the base of the statue in his work. Did Cole specifically reference this sculpture as a hidden representation and dialogue of conflict? With my method of exploration and rhizomatic review, I conclude that he did. Again, I am not relaying knowledge from previously published information, I am synthesizing what this image means to me within this process.

With rhizomatic review, I acquire a network of related information surrounding visual references in the paintings. The Interactive Tour tool proves very useful, as it is primed for rhizomatic review with additional links to more information. This process can be repeated with any questions that call for literature review, and I frequently repeat this process with Refined Inquiry and Refine Making and Play. I can return to an array information that I previously uncovered in Directed Literature Review, from which new rhizomes of discovery emerge. When my method becomes cyclical and iterative after initial questions and a body of literature is developed, the review can happen simultaneously with more refined play and inquiry.

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Refined Exploration

When inquiry is generated, it calls for action to address it. Similar to Kolb’s experiential learning cycle, when the observations are processed into concepts, experimentation through action follows. As mentioned in Generating Questions, my experimentation can proceed to Directed Literature Review or more play. When the play becomes directed based on the questions being pursued, Refined Exploration occurs. This play is less exploratory, but rather a response to the new inquiry it has generated. It continues to use play as an informant, versus literature. This occurs when I play more attentively with the interactive tool’s composition overlays in The Consummation of Empire. When I observed the compositional relationship between The Consummation of Empire and Destruction, I wanted to know if there were more relationships present, but within one image versus two. How might composition in The Consummation of Empire juxtapose important visual elements? This is before any literature review occurs; I remain critical within the Making and Play event and attempt to expand what I know about the composition. I now have a more clearly defined goal of what and how I want to observe, influenced by new meaning I have constructed.

Refined play also occurs after literature review, both directed and rhizomatic. When I have a better idea of the concepts and purpose for Cole’s constructions, I can return to my digital tool and explore this new insight. After resolving some of my questions surrounding the statue of Athena and its transition into the following
*Destruction*, I returned to play with an intention to uncover more observations and questions. The actions are refined to take a closer look at specific relationships that support the conceptual continuity between paintings. My Directed Literature Review influences what and how I want to observe through my developing understanding of how the paintings function to create meaning. I previously discovered how *The Consummation of Empire* foreshadows and transitions into *Destruction*, and now I want to see how *The Pastoral State* might set us up to read *The Consummation of Empire*.

I create a new experience through play to observe *The Pastoral State* and *The Consummation of Empire* more closely. I discovered that the winding path in *The Pastoral State* aligns with key narrative visuals in *The Consummation of Empire*. It is as if we can be prepped for how we should view *The Consummation of Empire* through the content and structure of *The Pastoral State*. This refined play, in turn, can repeat another event of Generating Questions. New inquiry may form from this observation, or it may refine the current question being addressed. This may then proceed to events of more play or literature review unless I am satisfied with a conclusion and resolution formed from prior knowledge. Similar to Rhizomatic Review, Refined Play can build up a network of new or refined questions related to one another.
Refined Inquiry

Forming inquiry is a crucial act in this method. It is foundational to remaining critical in this process and constantly propels the learning cycle forward. Sometimes the questions are new, and sometimes they are evolutions of previously asked questions. I distinguish and categorize these as Generating Questions and Refined Inquiry respectively. Newly generated questions develop laterally, presenting a broad range of inquiry to pursue. Refined inquiry develops vertically, branching out from preceding questions that evolve into a lineage of more specific and compelling questions. Figure 30 shows details of where Refined Inquiry can occur. This is evident when I ask about the general role of composition in Cole’s work, and then return to refine it as inquiry focusing on the specific relationships that it suggests.

Figure 30. Details of the method showing moments of refined inquiry.

The initial question I ask follows the observation of the aligning statues in The Consummation of Empire and Destruction. In my first general question, I asked, “Are these two elements related?” This question develops through Refined Exploration,
Directed Literature Review, and Rhizomatic Review. This caused Refined Play to ask, “How is Cole using composition to relate visual elements?” When I exhausted my observation, I began to ask why the statues were related. This brought me to literature review to ask, “Why are these elements related?” In Rhizomatic Review I revise the question to address the commentary and references Cole might be making by relating visual elements through composition. This, in turn, morphs into questions surrounding how the compositional relationships form continuity between the images. Through an iterative process of these events, the inquiry is constantly developing. Each question influences its revised offspring until I am asking specific questions and pulling a variety of information that culminates in a deeper understanding.
Chapter 5: Reflection and Implications

In this research, my aim was to demonstrate how digital media can be driven by critical making and play processes to function as a method of inquiry when observing complex traditional paintings. My research questions surrounded how digital media could reveal new information in a painting and how this could be driven by making and play processes for the purpose of inquiry. Matt Ratto’s critical making theory and Malcolm McCullough’s theory on digital craft guided my exploratory process and application of digital tools. As a digital artist, my unique perspective influences the way I engage with traditional paintings. Because of the affordance and breadth of possible forms that digital media can encompass, I imagine paintings in other forms and visualizations that are impossible to observe with the naked eye. This might mean imagining active figures as moving imagery in a time-based format. It might mean picturing a painted environment as an immersive virtual space. Even reinterpreting concepts and themes as playful interactive experiences is due to my point of view as a digital artist.

I let this virtual medium tilt my perception of traditional content to be reimagined as something different, something new. The soul of the original content is
still there, but it is evolved into an alternative digital representation. This process is more than just observing through a microscope to get a closer look; it is completely shifting the point of view and maintaining that view through a metamorphosis of many forms of existence. Each state of being is a unique digital form that can raise new questions about the content. I attribute my ability to imagine these many forms to my developed mental models. These predictive conceptualizations of digital manipulations allow me to generate curiosity and chase it through processes of making and play. When this process resolves I can return to the original painting, but I will never see it in the same way. I see through it, to reflections of the deep engagement that surfaces information I would have never even thought of searching for. The painting is no longer an artifact that I look at, it is an experience and network of meaning. I have a sense of ownership over that network because it was not simply absorbed from external information, it was internally synthesized by me.

I found that this process of digitally exploring paintings through making and play was a much more complex experience than I imagined. My method of inquiry consists of processes that can appear sequential, cyclical, and simultaneous. The method as a whole is a predictable collection of actions that can occur in an unpredictable progression. It is most difficult to describe in linear formats, like text but is best portrayed as an array of events. These events are:

- Selecting Content
• Active Looking & Forming Curiosities
• Selecting Digital Tools for Exploration
• Making and Play
• Generating Questions
• Directed Literature Review
• Rhizomatic Review
• Refined Exploration
• Refined Inquiry

These events are not listed in a chronological order, for they are not linear. However, there are predictable sequences of events. Certain events tend to group together with others to form blocks of actions that can be perceived more linearly in a macro view. Event blocks like Selecting Content and Forming Curiosities will typically precede events of Making and Play and Directed Literature Review. Other times, there are events that overlap or lead to completely different events depending on my state of inquiry, the content, and tool being used. For example, Directed Literature Review may proceed to Refined Exploration, Generating Questions, Rhizomatic Review, or Refined Inquiry. Two or more of these may even occur at the same time. Regardless of their progression, these events are the core components of my method of inquiry with digital tools. This process describes how digital media and critical exploration can be used in design-oriented research to function as a method of inquiry.
Figure 31. The flow of events in the internal process of exploring content with digital tools.
Within the scope of this research, the purpose of my method is to generate unconsidered questions and new insights surrounding traditional paintings. It is specifically successful in situations examining visual content that contains some element of realism. A prominent example of this comes from my exploration with Thomas Cole’s *The Course of Empire* paintings. Because I wanted to observe the paintings in a specific way that focused on opacity alterations, I selected and customized a digital tool of image manipulation that allowed me to do so. When observing things like the compositional similarities between the statues in *The Consummation of Empire* and *Destruction*, new considerations and questions arose. This was specifically due to the fact that I observed the images beyond the naked eye with digital tools. After literature review guided by rhizomatic thinking and iterations of events, I could synthesize new informed meaning in the paintings. My exploration guided me to form an understanding that Cole uses compositional juxtaposing between the statues modeled after Athena and the Borghese Gladiator to embed a subliminal commentary that supports the narrative of a religious utopia transforming into a violent state of conflicting claim to property. Although this instance exemplifies my intentions well, there are improvements that could be made to the method of inquiry.

A change that could have been implemented in my conceptual development of this method is more exploration with non-figurative and abstract paintings. I felt successful demonstrating how this method was applied to imagery with elements of realism, but not with abstracted visual content. Many times, I have been asked how I
imagine a Jackson Pollock painting to appear in a virtual environment. The flaw in this question is that it is specific to one digital tool (virtual reality in this case) versus an inquiry-centric consideration of many possible digital tools. Although untested, I am confident that my method could be applied to abstracted imagery. The events that make up the method are themselves abstract enough to embrace these types of paintings. However, I predict that I would need to be more attentive in the events of Active Looking & Forming Curiosities and Generating Questions so to avoid forming inquiry that is centered on elements of realism, like explicitly defined space and figures. Another improvement to this research is a greater examination of content that is not visually intensive.

Paintings themselves are only case studies here and should not narrowly cast this exploratory process in an exclusive light. I am interested in how this process can become more refined to accommodate material that is less visually intensive. I predict that through iterative testing with content beyond visual stimuli, patterns and modifications could emerge to adjust to inquiry into any type of subject matter. Perhaps less visually intensive concepts, like philosophical ideas, can be mapped into this process to inspire new thought and development. In this situation, I see the most significant characteristic of digital media as a method of inquiry to be its ability not just to visualize things in new ways, but to experience them in new ways through a variety of multisensorial constructions. My stance is that digital experiences that embody subjects of interest will generate new inquiry for the development of deeper understandings.
Moving forward, the big question is, “now that I have a deeper understanding, what
do I do with it?” I previously mentioned that this document focuses on my internal
process of exploration. The future thread of this research examines ways to externalize
my synthesized meaning through digital artifacts. This begins to focus on critical design,
which aims to offer new perspectives to the viewer/participant31. I am most interested
in ways I can exhibit these digital artifacts to inspire new dialogue and possible
connections between historical and contemporary concepts. From my previous
experience with projects in the conceptual develop this method, I see the internal digital
tool influencing the design of the presented artifact.

My externalized artifact communicating my understanding of Thomas Cole’s
work took the form of a large-scale installation using video projection and surround
sound. Although interactivity was not a part of the presented artifact, the mechanics of
the interactive tool in the internal process provided visualizations that inspired the
presented video and sound.

My goal with presented digital artifacts is not to formally educate someone on
the history or textual information surrounding the painting, but rather offer an
opportunity for a viewer to open new observations and considerations by
demonstrating my own discoveries. It is my hope that this method of observing will give

birth to new dialogue and ideas surrounding these historical works of art. I see digital media as a continuous advantage in this process because it can adapt to create an ongoing journey of active observation. Its ability to take form in interactive experiences allows for active participatory investigation driven by curiosity. An interactive experience has potential to become temporally unrestricted and ever-evolving to the input of the curious participant.

I am also interested in how this research can impact other makers. Making processes can often become linear productive paths with minimal consideration for the opportunity to engage with and observe things differently. This could be similarly said for acts of play as well. I hope to inspire other digital makers to become more reflective and critical in their making process. To those who consider themselves digital makers, your craft is a unique world of endless possibility and observations. Take advantage of this medium, making, and playful curiosity to chase the things that interest you. You will be surprised with how much it can reveal and how much more there is to know.

Additionally, I would like to see how this method can be applied to educational settings. My internal method of inquiry could expand upon educational theories like experiential learning. Knowing that my method has demonstrated new knowledge within fine arts, I plan to examine how it might play a role in the art classroom. Outside of a classroom, I will move forward with how to design artifacts to communicate complex or unconsidered concepts in paintings. I imagine art museums benefitting from digital artifacts to engage their visitors on a new level. This integration is already being
implemented in places like the ArtLens Gallery in Cleveland, OH. This gallery offers educational opportunities for visitors to explore many artworks digitally\(^{32}\) (figure 32).

![ArtLens Wall](http://www.clevelandart.org/artlens-gallery/artlens-wall)

**Figure 32.** The ArtLens Wall at the ArtLens Gallery in Cleveland, OH. Image from [http://www.clevelandart.org/artlens-gallery/artlens-wall](http://www.clevelandart.org/artlens-gallery/artlens-wall).

Peter Greenaway has also been a tremendous influence when contemplating presented artifacts. His series of work titled “Nine Classic Paintings Revisited” consists of multiple video projects that visually highlight formal elements of renown paintings, like Rembrandt’s *The Nightwatch*, and Davinci’s *The Last Supper*. Greenaway’s visualizations shed light on unnoticed elements and narrative of painting by offering a digital method of observation. I share his intention to provide opportunities to reimagine what these works mean in a contemporary setting as well as advocating for visual literacy. He is

[http://www.clevelandart.org/artlens-gallery/about](http://www.clevelandart.org/artlens-gallery/about)
frequently heard in numerous interviews stating, “Just because you’ve got eyes doesn’t mean you can see.”

Greenaway’s statement sums up my approach to exploring and communicating discoveries found in paintings through digital making and play. It takes practice and time to learn how to observe artwork properly, but by no means does this suggest that one should not try. It is my hope that this research can offer a way to make the process of engaging with artwork a bit more...engaging. There are compelling narratives, concepts, and emotionally dense expressions packed into the visualizations of our history. Through a contemporary lens built of reflective making and play with digital tools, these historical masterpieces can be opened to our imaginative curiosity and cast in a more familiar light.

Every generation uses the tools of its time to better understand the significance of everything around.

– Peter Greenaway, “Nine Classic Paintings Revisited” at UCLA Berkley

Bibliography


