Designing Compressed Narrative using a Reactive Frame:
The Influence of Spatial Relationships and Camera Composition on the Temporal Structure of Story Events

THESIS

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Abstract

This thesis explores how narrative is constructed within a single image composition and how it can inform contemporary approaches using the tools of 3D computer graphics and interactive technologies. Through a contextual review of classical painting and sculpture, a set of design principles is developed for a better understanding of the process for constructing complex narrative in purely visual form. These principles focus on how spatial relationships can influence a viewer’s understanding of the temporal structure of a story. The review continues with an exploration of how these principles can be adopted and augmented in new forms of digital media.

The second stage of research was to develop a project that presents a narrative in a digital 3D space that allows viewers to actively participate in the process of observing and reconstructing the narrative. By focusing on story and utilizing the design principles of single image complex narrative, a real-time 3D composition was created with a new system for engaging the viewer called the Reactive Frame. The result is a hybrid work that creates a dialogue between classical traditions of narrative in composition and modern techniques using computer graphics and real-time reaction to the viewer.
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Chapter 1: Introduction

Visual narrative has always been a widely used method of communication. From early cave paintings in France to the comics in Sunday newspapers, it provides people with a way to entertain, inform and instruct. Visual narrative provides the storyteller with a way to convey a message that is not impeded by communication barriers such as written language. By using forms of visual narrative such as photography, sculpture and painting, a complex story that would take numerous pages of text can be illustrated visually in a comparatively smaller space and understood by the viewer in less time. Subsequently, the more the narrative is condensed in the single image the more complex the composition may become. Many examples of this combination of condensed storytelling and complex compositions can be found in various works of art throughout the history of visual culture.

Use of visual narrative presented in a single panel, depicting relatively complex situations or relationships, was a common method of mass communication during the Italian Renaissance. Of all forms, painting and sculpture were the predominant methods for storytelling. Artists were commissioned to cover cathedrals, inside and out, with elaborate depictions of the Bible. It was a convenient way to pass along stories to the masses and provide a visual aid to the priests speaking from the pulpit.
This research focuses on how these kinds of narrative constructions can be used to both inform and develop new forms of media, such as with three-dimensional computer modeling and virtual environments.

With the advances in digital technology come many new possibilities for the visual storyteller. Often, new technology ends up causing artists to focus on the currently practiced methods to integrate the technology or let the technology dictate the design process behind the look of the artwork. It is important to review how and why techniques were developed in the first place by examining practices in historic artwork.

How can animators and filmmakers be informed by the design methods used in single panel visual narratives when developing artwork using new media to convey a story? How do spatial relationships and composition in these visual narratives influence the temporal structure and understanding of story events?

While the audience for this research is primarily digital artists who focus in pictorial narratives, it can be informative to anyone interested in methods for conveying narrative more effectively using visual form. I feel this research will provide the audience with a greater insight into traditional methods of creating compressed narratives while exploring new media as tools for visual narrative creation.

The first part of this research was to develop a definition for compressed narrative within static visual media. Then a contextual review was conducted of artworks that meet this definition, spanning a range of media including painting, photography, and sculpture. As a result of this review, commonly implemented techniques for designing compressed visual narrative are discussed based on how and why the techniques have been used.
As an exploration of how these techniques have been adopted and augmented in new forms of digital media, I then reviewed a series of new media artists working with approaches that appear to extend the ways in which compressed narrative can be thought of.

From these reviewed works, I discuss possible solutions for developing compressed narrative using new media. I then conduct experiments for how these solutions can be synthesized to develop a project using three dimensional character models and environments to create a complex compressed narrative with a novel method for viewers to actively participate in the process of discovering and deconstructing the story.
Chapter 2: Compressed Narrative

In this chapter I will first provide a definition of what Compressed Narrative is with regard to visual narratives. Based on this definition I will discuss a list of common techniques based on a review of various works that would be considered Compressed Narrative. Each technique will be broken down into a short description, defining it, and detailing how it relates to the construction of the image. This is intended to provide the reader with a better understanding of the process for designing compressed narrative in a visual form in comparison to written or spoken methods.

What is Compressed Narrative?

In a sense all narrative is subject to some form of compression. For this reason, I have assigned the term “compressed narrative” to describe a narrative that is presented using only a limited number of important moments in time that have been selected from a much larger story. The purpose is to convey a complex story as effectively as possible using a limited amount of information. This would be different from “minimal narrative” which Gerald Prince defines in his book Dictionary of Narratology as “a narrative representing only a single event or temporal juncture” (53). An example of this would be “Jon kicked the soccer ball” or “Emily ate a sandwich”. In these situations there is no implication that additional information takes place outside of the single event presenting the narrative. In comparison, compressed narrative is in many ways a reductive process.
requiring the artist to be selective when choosing the moment or moments to represent. Even though there are fewer narrative events being presented, the overall story is no less complex.

Visual narrative provides a vast library of works to study spanning from painting to animation, each with their own methods for construction of their narratives. Rather than reviewing visual narrative as a whole I am focusing on the static pictorial forms such as painting, drawing, and sculpture. In regard to sculpture, I am limiting the study to variations of low relief to eliminate the compositional differences of viewing a subject in the round. One requirement is that the visualization of elements such as characters and environment must remain static. The purpose of this is to eliminate time based media such as film and animation which require an entirely different set of design considerations for moving characters, sound, and editing. This is because time based media has action and dialogue over the length of a shot to present that information rather than distilling it into a single representation. I am also choosing to exclude any work that involves the pairing of image with written word often seen with graphic narrative such as comics. This is because the incorporation of text reduces the importance on the image to tell the story and there are separate considerations for the relationship between pairing of word and image.

I found there are two distinct categories in which visual compressed narrative can be defined based on the number of events presented within a single panel. The first and more compressed category is referred to as a mono-scenic representation and only uses a
single narrative event to represent an entire story (Andrews 120). The second category, which is referred to as a poly-scenic or continuous narrative representation, uses multiple events occurring simultaneously within the same frame (Andrews 120). Often a single physical location is represented with the characters repeated throughout the space at different moments within the narrative.

**Narrative in a mono-scenic representation**

The first category of compressed narrative is the mono-scenic representation. This is when a narrative is reduced down to a single moment to embody a story in its entirety. It is the most commonly used representation of narrative in static pictorial artwork. This is because of the dynamic nature which the elements are illustrated suggesting the capturing of a moment in time. Unlike the second category, poly-scenic narrative, the consideration of event transition is not necessary. Instead all the importance lies in compositional techniques for the decisively selected event. To create a successful mono-scenic narrative there are certain narrative and subsequent compositional choices to be made to produce a captivating and descriptive image. The principles discussed below are not exclusive to mono-scenic narrative but rather those which I consider a foundation to compressed narrative in static visual media.

**Case Study in Mono-scenic Narrative: The Sacrifice of Isaac**

One commonly discussed mono-scenic narrative from the Italian Renaissance is *The Sacrifice of Isaac* by Lorenzo Ghiberti in 1401. The relief sculpture was created as
part of a competition, the winner of which would be commissioned to create the north
dacing doors of the Florence Baptistery. The finalists consisted of Lorenzo Ghiberti and
Filippo Brunelleschi, each with his own interpretation of the biblical story of the Sacrifice
of Isaac as can be seen in Figure 1. The story revolves around Abraham being ordered by
God to kill his son Isaac as an act of faith (Genesis 22:2). Then Abraham, Isaac and two
other servants ascend into the mountains with a sacrificial lamb. When near the top
Abraham asks the two servants to stay behind. Alone Abraham puts his son on the altar
instead of the lamb. As Abraham readies himself with the knife, an Angel descends from
the heavens to stop him.

While both artists represent the sacrifice, they differ slightly in their
interpretations of the event. Each artist presents Abraham after he and Isaac have left the
two servants with their donkey. Isaac has been put on the altar in place of the ram and
Abraham has begun the sacrifice. Where they differ is that Brunelleschi presents the
moment with Abraham pressing the knife to Isaac’s throat and his hand stayed by the
angel. In this instance the act of sacrifice has already been stopped by the angel (Lubbock
152). In Ghiberti’s version Abraham is about take action and the angel has only just
appeared, rushing to Isaac’s aid. Because the angel has not yet intervened, it leaves the
viewer to question the outcome of the event. Rather than showing the resolution to the
narrative Ghiberti presents the climactic moment prior to the resolution (Lubbock 154).
These pieces show just how much information could be presented in just a single panel of
well-orchestrated action. The subtle differences between each composition have a
significant impact on the overall comprehension of the narrative.
Mono-scenic Techniques

Choosing the Right Moment

Since a mono-scenic representation uses only a single moment to embody the entire story, the event that the artist chooses to portray is very important. It must be dynamic in order to engage the viewer while informative enough that the viewer can reconstruct the majority of the story. When selecting the event it is best to break down the narrative into its most important moments. There are various deconstructions of plot structures that can be used as reference such as the Freytag Pyramid, Dramatic Arc, or Plot Diagram. The Freytag Pyramid includes the exposition, rising action, climax, falling action, and finally the denouement (Prince 36).
The first plot point and the beginning of the narrative is the *exposition*. This plot point includes the introduction of characters and current circumstances of the story’s “world” prior to any action (Prince 28). This sets the stage in many ways so the story can proceed. The exposition usually takes place at the very beginning of a story and makes up a small portion of the overall narrative. Because it only introduces the characters and story-world it lacks the complexity of later plot points and is not the optimal event choice. Take for instance the story of the *Sacrifice of Isaac*. The exposition could possibly include showing Isaac and his father Abraham in their home with the servants. At this point there is no conflict or action occurring, providing very little information to the viewer about what is about to take place.

The second plot point is known as the *rising action*. In this part of the narrative the conflict against which the protagonist must struggle is introduced (Prince 15). This is really where the story begins to move forward as the protagonist is called into action. In the *Sacrifice of Isaac* the rising action would be when God instructs Abraham to sacrifice his son to prove his unyielding faith. It is more difficult to represent the rising action in a single image because it consists of a much larger set of events centering on how the protagonist struggles with the conflict. While the rising action is an important part of the narrative it is not as informative or as dynamic as the next plot point.

The third plot point is known as the *climax*. In this part of the narrative the protagonist has reached “the point of greatest tension” and is considered to be the culmination of the protagonist's struggle with the conflict during the rising action (Prince 14). This is the most dynamic of all sections of the narrative because it is the moment that
the protagonist will conduct the final action that will lead to the resolution of the narrative. The climax is a very useful point to represent in mono-scenic narrative because the protagonist is facing the final hurdle. It tends to provide a very dramatic image because the outcome is unknown. At this point the protagonist could succeed or falter and the audience can only predict what will happen. Ghiberti’s version of the *Sacrifice of Isaac* meets these requirements because the resolution is unknown and characters are still in the middle of the action.

Following the climax is the *falling action*. This is when the tension begins to subside and the protagonist either starts to overcome the obstacle or succumbs. Falling action encompasses all events that occur between the *climax* and the *resolution*. Filippo Brunelleschi’s interpretation of the Sacrifice of Isaac depicts the falling action rather than the climax, when Abraham’s hand has been stopped and the audience knows that Isaac will be alright. This moment is after the height of suspense, but the story has not yet reached its resolution.

The *denouement* which is similar to the *resolution* is the conclusion to the narrative providing the final outcome of the conflict (Prince 82). In the story of the Sacrifice of Isaac, the resolution occurs when Abraham ultimately sacrifices the ram instead of Isaac. Constructing mono-scenic narrative around the resolution allows the artist to demonstrate the outcome to the story, leaving the audience to reconstruct the events leading up to that result.

It all comes down to how clear the interpretation will be by the audience. The exposition and rising action provide information about the protagonist, but only minor
narrative action. By choosing to use the climax the audience is left to question whether or not the protagonist will overcome the conflict. Depicting falling action allows the artist to hint at both the climax and the resolution. The representation of the resolution provides the audience with ending to the plot and subsequently a meaning for the journey of the protagonist. On the other hand there is very little tension in the resolution because the protagonist is no longer in harm’s way, for better or for worse. No matter which plot point is chosen to represent the narrative event there are inherent shortcomings to how accurately the audience can reconstruct the narrative in its entirety.

*Presenting the Event in Motion*

No matter which event is selected to present the narrative it is common to capture the moment in progress. The fact that the event is displayed using a static medium does not mean that it has to exhibit only stillness. Illustrating the event in action not only creates visual tension but can help inform the viewer at which point the event takes place within the narrative. For instance, the Renaissance frescos and sculptures use characters posed dynamically, incorporating moving cloth to suggest blowing wind or the swift movement of a character. Suggesting motion can make the characters come alive and create a sense that the viewer is witnessing a portion of the story; that there is more to it than what is visibly depicted. This generates curiosity about the narrative, causing the viewer to wonder what happened prior to or just after the action being represented. Polyscenic narrative often capitalizes on this curiosity; a character’s line of action and the
The overall direction of movement within the scene can be used to help direct the viewer through the composition.

**Body Language**

When designing a representation of an event in motion, one important thing to consider is body language. A character’s pose can be used as a form of non-verbal method of communication. Something that is often overlooked in day to day interactions is our ability to assess a situation quickly via a person’s posture or facial expression. It is easy to recognize someone who is having a good day from someone who is not. This is because we as humans can process body language at an almost subconscious level. In compressed narrative it can be used to quickly portray action or intent within the story, as well as illustrate hierarchy or relationships between characters. For example, in Figure 2 the characters of Adam and Eve are easily recognized to cower in fear away from an angel whose position of power is exemplified through elevation in the scene.
Figure 2. Detail from Michelangelo’s *Origin of Sin, Adam and Eve in Paradise*, 1509-10.

Just as posture and placement convey important details about the characters’ motivations, the depiction of props and how they are used can illuminate to the viewer this information as well. The angel shows aggression, pointing a sword in the direction of Adam and Eve, and it is clear that they are on opposing sides; the angel is clearly using the sword to threaten rather than protect. Adam and Eve’s fear and flight responses confirm the nature of the gesture. This principle is still visible today, as pointed out by Will Eisner in *Graphic Storytelling and Visual Narrative* (Figure 3).
Compressed narrative using mono-scenic representation by its nature sets limits on how much information can be presented. As a result, important information will be left out and the audience will have to fill in that information on their own. In the study of written narrative there is a common element known as paratext which has an indirect effect on the overall impact and understanding of the narrative by the audience. Paratext consists of all the elements such as titles, reviews, book jackets and basically anything that occur outside of the actual narrative (Abbott 30). This information can be used to direct the audience toward a more accurate comprehension of the narrative (or it can have the opposite effect by misleading the audience). By just incorporating a title the reader will begin the narrative with expectations of what the subject matter will be and possibly what the protagonist will struggle against. This can be true as well for visual narrative, especially compressed narrative.
With the limited amount of time and condensed visual space, compressed narrative often relies on paratext to fully convey its message accurately. Again referring back to the competition panels of the *Sacrifice of Isaac* by Ghiberti and Brunelleschi, if the title was unknown and the audience was unfamiliar with the biblical story then it would be difficult to understand the narrative. It could be perceived as one man trying to kill a boy while two men sit nearby seemingly oblivious to the interaction. Then there is a winged creature that is flying through the air toward the group of people with a mysterious motivation. As we can see the paratext information has a lot of influence on the overall clarity of image.

*Archetype*

While paratext consists of primarily external pieces of information that may or may not be intended by the artist, archetypes are internal elements that are deliberately included to influence the interpretation of the narrative. Archetype is a multidisciplinary term to encompass an “idea or image that serves as an original model from which copies are made” (Sullivan 252). When designing a compressed narrative it is important to adopt the depiction of a character or setting that matches the audience’s expectations. The use of an archetype will supply a variety of narrative information to direct the audience. This is demonstrated in an illustration from the book *Graphic Storytelling and Visual Narrative*, which can be seen in Figure 4. Will Eisner discusses how these design choices will be heavily influenced by “social experience” and what is accepted by the culture (12). While archetypes may not be the most creative route to take for character design, they are the quickest way for audience to reach a consensus for who the character is and
what. When developing the character it is important to consider clothing, hairstyle, body style, and age.

Figure 4. Illustration from Graphic Storytelling and Visual Narrative, Will Eisner, 2008.

Archetype can also be applied to the setting and props with consideration to the related character. A change in just one element of a setting can make a drastic difference in how the audience perceives the narrative. Take for instance, a man standing in a graveyard in the middle of the day and holding a shovel. It would be easy for the audience to come to the conclusion that this man is a grounds keeper working for the cemetery. Now take this same character, in the same graveyard, with the same shovel, but it is a stormy night instead. The audience would now likely assume the character to be a grave robber or at least up to something sinister. The same would apply to props as Eisner illustrates in Figure 5.
Archetype is not without pitfalls of its own. First off, a specific archetype may no longer be accurate depending on the time period it was created when compared to when it was viewed. What someone might consider a fashion model to look like in 1950s is very different from what is the standard today. Secondly, they are greatly influenced by the specific country of origin or culture. What might translate well as an archetype for one culture or time period might be completely different for another.

By considering archetype when developing the characters and settings, a story can be condensed down to provide more narrative clarity. Since the elements are designed to work with the cultural familiarity of the audience, there is no need for extraneous descriptions using text or additional narrative events. While this may limit the scale of the audience, choosing to represent what is familiar to the majority provides a streamlined method for conveying narrative more efficiently which is a goal of compressed narrative.
Narrative in a Poly-scenic Representation

The second category of compressed narrative is known as poly-scenic or continuous narrative. This is when multiple “scenes, moments, or actions” are combined into “a unified context of some kind, usually indicated by a frame” (Andrews 120). The primary difference between poly-scenic and sequential narrative, such as comics, is that the events are not separated into multiple panels and typically share a singular congruous background. Even though there is a lack of visible barriers between each set of repeated characters, they are arranged into “distinct compositional units” to suggest that “more than one moment is represented” (Andrews 120). While most of the mono-scenic design methods described previously are incorporated into poly-scenic representations, there are additional considerations to be made to inform temporal continuity and narrative clarity between events.

Case Study in Poly-scenic Narrative: Masaccio’s Tribute Money

One Renaissance artwork that keenly presents a poly-scenic approach to narrative is Masaccio’s The Tribute Money 1420 (Figure 6). The fresco is a retelling of the story of when Jesus and the Saints were prompted to pay a tribute upon entering the city of Capernaum (Matthew 17:24-27). After a discussion of liability for the taxes, Jesus performs a miracle by having St. Peter collect money out of the mouth of a fish in the sea of Galilee to pay the tribute (Matthew 17:24-27). This relatively complex narrative is broken down into just three events by Masaccio. In the center of the composition is the
discussion between Jesus, the Saints, and the Tax collector resulting in Jesus directing St. Peter towards the body of water to the left. The second event presented is of St. Peter collecting money out of the mouth of the fish. It is possible to connect the repetition of character of St. Peter based on the color and style of his clothing as well as hair. The conclusion to the narrative takes place at the far right of the image with St. Peter paying the tax collector at the entrance to the city.

Unlike mono-scenic narrative, when presenting multiple events it is important that the viewer recognize that there are separate events and know how to progress through them. In order to direct the viewer to the beginning of the narrative in the *Tribute Money* the perspective lines from the buildings align through a single point placed at the center of Jesus’ face (Lubbock 211). Another important observation by Jules Lubbock about this composition is that these events appear to be occurring in quick succession of one another within a single location when in actuality they place take over an extensive amount of time and space (*Storytelling* 209 – 211).
Figure 6. Masaccio, The Tribute Money, 1420

*Poly-scenic Techniques*

*Character Reoccurrence*

The repetition of a specific character in the same image helps the viewer to recognize that multiple events over time are being represented, and the viewer can surmise that the events are not occurring simultaneously. In order to assist in recognizing that it is the same character being repeated, prominent character attributes are necessary. For example, clothing or props that are specific to the repeated character can signify his or her identity. This can be seen in *The Tribute Money* with both the characters of Saint Peter and the tax collector. Elements of archetype can also be used to make the character identifiable.
Closure and Event Transition

As a result of incorporating more than one narrative event the audience is now required to fill in the missing information that occurs between the events. Much like cutting from camera shot to shot in film or from panel to panel in comics, compressed narrative uses physical and temporal gaps that the audience must fill. I found similarities between two of the transitions defined by Scott McCloud with those used in poly-scenic narrative. Those categories are “action to action” and “scene to scene” based on the overall level of closure needed to fill the gap between panels (Understanding Comics 70-72).

![Figure 7 Event transitions action to action (left) and scene to scene (right) from Scott McCloud’s Understanding Comics](image)

An “action to action” transition requires minimal involvement on the audience to fill the gap. McCloud gives the example of a baseball player winding up for a swing and hitting the ball (Figure 7). The nature of action to action limits its use in compressed
narrative because the space required to represent each action can become overwhelming. This is because compressed narratives cover such a large amount of information in a limited amount of space. However, action to action transitions could be used to create a bridge between events shown, making it easier to fill the gaps depending on the level of compressed visual space.

The transition type more commonly implemented in compressed narrative is scene to scene. In a scene to scene transition the viewer may drastically be shifted across time and space and must use deductive reasoning to fill the gap (Understanding 71). The distinction can seem blurred between these two transitions because of the nature of compressing visual space with temporal space creates a feeling of continuous action. This is the case in Masaccio’s Tribute Money with Saint Peter collecting the money from the fish and presenting it to the tax collector without any indication of significant time change.

Directing the Viewer

There are many different ways of guiding the viewer through the image so as to understand the order of narrative events. Cultural reading conventions are often utilized in compressed narrative to organize the events within the composition to capitalize on the viewer’s natural inclination to read from left to right or right to left. This suggests that the sequence of events models the linear progression of the image. As previously mentioned, body language and posing can be powerful tools for guiding the viewer through an image. In cases like Masaccio’s Tribute Money, perspective is also used to
indicate the order of events. As the narrative becomes more complex, architectural and geographical space can be recreated within the image, so that the viewer can surmise the order of events based on location. Using location as an indicator requires pre-existing knowledge of the story on the part of the viewer, so the artist is relying heavily on paratext. For example, Hans Memling’s *Scenes from the Passion* (Figure 8) depicts the capture and crucifixion of Jesus by showing the progression of events through the space of the town (Andrews 33). In addition to prior knowledge of the story, the viewer is assisted by referring back to an outside text known as the *Giardino de oration*, which was intended to aid the memory and guide the viewer in “how best to meditate upon and remember the story” (Andrews 29). The piece was intended for a viewer who would understand that the betrayal by Judas occurred outside of town, that Jesus was paraded through town on the way to be crucified on the nearby hill.
Figure 8. Hans Memling, *Passion*, 1470.
Chapter 3: Explorations in New Media

The second part of this research focuses on how compressed narrative can be developed using new media such as three dimensional computer modeling and virtual environments. Digital media provides the artist with more accessibility to create work that alleviates many of the limitations of physical media such as the page and canvas.

One artist and theorist whose work has contributed to the research of these new approaches is Scott McCloud, the creator of the Comic Zot! and the book series Understanding Comics in 1993, Reinventing Comics in 2000, and Making Comics in 2006.

McCloud introduces in his second book Reinventing Comics with the idea that computers provide the artist with the ability to create and display comics on what he calls the “Infinite Canvas” (222). By viewing the computer monitor not as a frame but as a window, the audience can experience a comic without the restriction of the page or any other print related limitation (Reinventing Comics 222). McCloud discusses how throughout history there are examples of attempting to present a narrative over one expansive canvas but always struggling with limitations of the medium. While this research does not limit itself strictly to comics or sequential narrative viewpoint, the concept of the infinite canvas has potential for developing methods for creating expansive visual narrative in other ways within a digital environment. The following contemporary
works in new media serve as examples for exploring the variations in which expanded, yet static, visual narratives can be developed using this concept of the infinite canvas.

*Tim MacMillan: Timeslice film “Ferment”*

One artist whose work introduced alternative storytelling possibilities for compressed narrative is the work of Tim MacMillian. In the early 1980’s he developed a system that was a combination of both traditional photography and time base media which he patented as “Time-Slice” films. This is accomplished by using a series of cameras which are placed in different configurations simulating various dolly shots. These cameras are then triggered simultaneously to capture an event from different angles. Finally, the images are then combined sequentially to create the effect of a camera moving within a frozen space. In his 1999 film, *Ferment*, Tim MacMillian provides an alternative look at static narrative in time based media.

*Ferment* borders on the edge of a mono-scenic representation because it could still be considered to represent a single moment in time. For the first 36 seconds of the film there is a gradual slowing of time until the death of a man while he is sitting on a park bench with his family. After this point, the characters remain static while the camera moves through the town encountering people fighting in alleyways, dining in restaurants, reminiscing over photographs, and making love. In the final moments of the film the camera enters through a window to see a woman giving birth. This creates a relationship between the end of one person’s life and the beginning of another. Even though it might
not be storytelling in the conventional sense, because it lacks a structured plot, it does attempt a narrative by presenting a cycle of life.

In *Ferment*, MacMillian introduces a new means to freeze a moment photographically in three dimensions. A primary characteristic of this film that informs this research is the role of the camera in creating a controlled point of view through the static 3D space depicting the narrative. By using the camera frame as it moves through the space, the information is progressively revealed to the viewer, creating an experience of the narrative moments that is very different from the ability to see every moment depicted in a single large canvas.

*Nagi Noda: “Sentimental Journey”*

The music video by artist Nagi Noda, *Sentimental Journey*, provides a unique set of methods for presenting static narrative using time based media. It demonstrates the movement of the character through rapid repetition of the character itself. This is achieved by using multiple actors who look alike placed adjacent to one another posed in the progressive action of the movement. The result produces the effect of viewing the character’s full path of action throughout the entire story. This is demonstrated in a still from *Sentimental Journey* as seen in Figure 9. The music video exhibits various techniques that could inform the narrative design process for other forms of new media in regards to compressed narrative.
“Sentimental Journey”

In her music video, *Sentimental Journey*, Nagi Noda uses a distinct method of representing time by using closely repeated characters and props in a very similar method to time-lapse photography. Though the visual pathways represent the characters in constant action, it is clear that some specific areas are more important than others. The character repetition provides a way to direct the audience between what could be considered the most important narrative events. These events might be considered the protagonist playing, falling and hurting her leg, encountering a storm, witnessing her mother’s death, and finally changing to prepare for the funeral.

The event transitions would then be more similar to McCloud’s third classification, “subject to subject” requiring a larger gap to be filled but needing much less space to represent it (*Understanding Comics* 71). Even though there is a larger temporal gap, the narrow physical gap allows for a quick comparison to be made. With *Sentimental Journey* if there were no intermediate poses, both the physical gap and the
temporal gap would be spread out and difficult to connect through the slow movement of the camera. Subsequently the intermediate poses allow for the gap between narrative events to be filled both spatially and contextually as the camera moves along them.

The camera also acts as a storytelling device to obstruct the audience’s view of the later events of the narrative. This produces a stronger impact when encountering events and seeing how they relate to earlier moments. One instance in particular is when the camera dollies into the interior of the home where the death of a family member is revealed. The camera retains the tight framing around the mother sick in bed and the audience is unable to see that the mother’s soul is rising up above the bed and out of the house (Figure 10). If this narrative were to be always viewed in its entirety, as can be seen in the final moments of the music video, the angel rising into the air would draw too much attention. This would disrupt the narrative process because the audience would witness the resolution prematurely.

Figure 10. Stills from Sentimental Journey, Nagi Noda, 2003.
Another interesting technique that *Sentimental Journey* incorporates is the use of abrupt changes in the set as a way to signify dramatic shifts in time and setting. It was common for traditional poly-scenic representations to depend on a single continuous background suggesting a single location. As an alternative the adjustment in the qualities of lighting and environment can help to present the cues. For instance, in *Sentimental Journey* shortly after picking up the apple to eat it, the protagonist encounters a storm which produces a distinct change in coloration of the ground giving the appearance that it has rained (Figure 11). These techniques are an efficient way to communicate temporal shifts throughout a space without the reliance upon characters. Furthermore, it allows for additional ways to direct the viewer through the correct order of events.

![Image](image.png)

Nagi Noda institutes many non-traditional techniques for designing poly-scenic narrative using a time based medium. Her usage of repetitious characters creates a dynamic method for connecting narrative events to help the audience close the gap with ease. While this presents a steady dissemination of information, I feel it is maybe too straightforward. It leaves very little room for the audience to use their imagination to fill-in these gaps. Part of foundation of poly-scenic narrative is to generate an efficient telling of the narrative details. This is a balancing act to incorporate just the right amount of information for the audience without making the composition too cumbersome. The most valuable element that Noda employs for the purposes of designing compressed narrative is a moving camera. It proves to be a useful tool to guide the audience through the narrative as well as establish a more dynamic interaction between events.

*Bar Sequence from “The Other Guys”*

One work that was very influential for me the discovery of new techniques for compressed narrative was a short sequence in the film *The Other Guys* from 2010. The scene encompasses an entire night of debauchery at a local bar instigated by the two main characters played by Will Ferrell and Mark Walberg. The film displays many of the same methods of traditional poly-scenic narrative. All of the characters remain static through the entire piece and the poses are dynamically captured. There is a condensing of what could be upwards of four hours of information down to only five events presented over 45 seconds of film time. Furthermore, only a single environment, in this case the bar, is utilized for the whole narrative. The sequence offers new perspectives on how camera
movement can suggest a sense of deeper space as well as an audience’s presence within a scene.

This sequence explores how an environment can be utilized when telling a story to develop a stronger sense of space. In the music video by Nagi Noda the character pathways and narrative events are positioned in relatively the same z dimensional space, remaining within the visual plane of existence. Subsequently, the composition yields a very shallow space by using only a left to right dolly movement for the camera. The “bar sequence” explores the location by moving forward along the z axis panning back and forth to witness each event. The camera path suggests the audience is a passive member within the space and witnessing the events as they occur. Comparatively, the bar sequence demonstrates a rich three-dimensional space by having the audience move through the space rather than view it from the outside.

This style of visualization is uncommon for traditional pictorial narrative because of the rigid compositional frame. The moving camera grants the storyteller an important level of control in revealing and framing the narrative as it develops, and demonstrates how many of the concepts of poly-scenic narrative could be applied to three dimensional virtual environments.

Conclusions to New Media Examples

The most important element in these works is the incorporation of a non-static composition through the use of a directed camera. They suggest a possible way that the camera can be used in conjunction with an expansive canvas to create complex static
narratives. The camera brings the viewer into the dimensional space of the environment. This suggests a more immersive experience than what traditional paintings allow, which begins to approach the viewer experience I was interested in recreating specific to 3D space. Furthermore, the camera movement provides the ability to more clearly narrate the story by keeping the viewer focused on only a section of the larger image. While all of these examples offer new ways to look at static narrative they are still limited to a passive experience for the audience. The narrative is restricted to a set amount of time set forth by the film and there is no way to speed up, slow down, or introduce variation to the experience. Other technologies available could allow for a pairing of dynamic camera movement without the restrictions of linear time based media.
Chapter 4: The Reactive Frame

The purpose for this research was to think about how the storytelling process in compressed narrative, as it is often found in examples of static visual media, could be re-imagined through modern technology. I appreciated many of the works from the Renaissance for their ability to present such a complex narrative within a single image. However, these works are hindered by various physical limitations which restricted their ability to reach a wide audience. For instance, the Bayeux Tapestry and Trajan’s Column presented incredibly complicated and lengthy narratives, but are difficult to view due to their extensive spatial requirements. Photographic reproductions allow the works to be viewed remotely in modern culture, but the full impact of the viewing experience of the original is not retained. Time based media such as animation and film could be viewed as descendants of these earlier storytelling mediums, but they can more easily reach broad audiences without physical limitations. On the other hand, they lack the participatory experience of exploring a vast fresco or sculpture in person.

With traditional film and animation the audience is limited to a linear time-based experience as they remain stationary during the viewing. From the first frame there is a very limited ability to control the flow of information depending on the method of presentation, which is especially true in a theater or gallery. Even though the audience may be required to mentally fill in gaps between shots in order to fully understand the story, they do not have the experience of actively participating the storytelling process.
What I find interesting about mono-scenic and poly-scenic examples of single image compressed narrative is that it the viewer can develop an understanding of the story while experiencing it at his or her own pace.

This process of narrative reconstruction on the part of the viewer can be challenging at times with all the various methods for event organization. Similar to a complex math equation, without knowing the order of operations, multiple solutions can be produced while only one may be the correct answer. Drawing on contemporary new media techniques as seen in Nagi Noda’s music video as well as other films using “time-slicing” and “frozen moments,” the incorporation of a moving camera can act as a guide to understanding the narrative. However, these examples still embrace a linear time-based media format restricting the viewer’s ability to actively explore the narrative at his or her own pace. The way in which the camera is moving through 3D space in these works has led me to the idea of creating a similar camera movement for exploring a poly-scenic representation of a story exhibiting qualities of compressed narrative, while allowing for a participatory viewer experience that can operate to draw attention to the story telling process.

**Definition and Function**

The Reactive Frame is my exploration in new media to create a unique way of viewing a large complex visual narrative by implementing a non-static composition to explore the narrative. This was influenced by some of the methods presented in the sequence from the film The Other Guys. I was also inspired by a concept known as the
“Infinite Canvas” introduced by Scott McCloud in terms of function (Reinventing Comics 200). McCloud’s suggestion is to use the “computer screen as a window rather than a page” allowing for more freedom in layout design without the structural limitations of the page (Reinventing Comics 222). This led me to consider how virtual environments could serve as a limitless canvas for creating a rich narrative in a three dimensional space.

The premise behind the Reactive Frame is to use a virtual camera to act as a window into a large three dimensional environment. The window frame could function as a storytelling device by purposefully occluding narrative information, unlike the simultaneous viewing of poly-scenic narratives. This camera then moves “reactively” to simulate the viewer exploring a larger physical pictorial space. To make this feel more natural the relationship between the head of a viewer and a computer display must correspond to the camera within a virtual environment. By using a facial recognition algorithm along with a web camera, the position of the viewer’s head can be tracked in relation to the display. As the viewer’s head moves, the virtual camera translates to match. The camera only reveals new information when the viewer chooses to explore the space, thus allowing for sustained observation of the same location if the viewer so desires. The viewer must take an active role in the storytelling process to reveal information. This produces distinct influences over the storytelling process as well as the audience’s experience of the narrative.
Considerations for Storytelling

An important part of working with complex visual narrative is to assist the viewer with the process of reconstructing the story. With a narrative that has been so meticulously constructed it is vital that the viewer recognize the intended order of events and progress accordingly. There are a variety of traditional methods, including the use of perspective (Masaccio, Tribute Money) and positioning events temporally based on reading conventions (Bayuex Tapestry) that help direct the viewer. These methods become less useful when not witnessing the entire image simultaneously. Furthermore since the Reactive Frame allows the camera to translate in multiple directions while limiting the overall visibility of the narrative, it can easily be possible for an event to be skipped. To help alleviate some of these issues, the virtual camera is connected to a pre-defined track that the camera slides along as the viewer explores. This is not meant to feel restrictive but rather to guide them along the path. The viewer still has freedom to move around the environment, stopping at any point while ensuring that no event can be overlooked. It is also possible to revisit previously explored events because the camera movement is not limited to only forward time progress. The viewer can opt to observe the narrate events in reverse.

Considerations for Audience Experience

The Reactive frame is meant to create an experience more akin to observing a painting or relief sculpture rather than interacting with a game environment or watching a film. It is intended to be a hybrid of these experiences, allowing the viewer to take on an
active role when reconstructing the narrative. For the Reactive Frame, I am consciously limiting the movement of the virtual camera to only translation while opting against rotation. Rather than allowing for a full range of movement throughout the environment like a video game, where the purpose is to explore in every direction, I tried to consider the experience of a large relief sculpture in a gallery space. In this situation the viewer should be able to approach the sculpture, requiring movement to the left and right to examine each aspect. In doing so the new vantage point will be altered, possibly revealing occluded information. This restriction from exploring the narrative space thoroughly allows for specific information to be presented only in the necessary locations. This maintains an effect that the work is being observed through a window and not a sculpture in the round.
Chapter 5: Project Documentation

Project Development and Influences

My goal was to create a three dimensional composition presenting a complex narrative that exhibited many of same mono-scenic and poly-scenic techniques I had researched. Furthermore, I wanted to explore how adopting the Reactive Frame as a storytelling device would influence the design process. While developing the look of the narrative, I tried to reflect on the religious frescos and relief sculptures of the Italian Renaissance. The classical works of Giotto, Ghiberti, and Masaccio were very influential in the overall subject matter for the project. More than just a visual style, the time period of their creation also presented a dynamic relationship between science and religion.

The Catholic Church was steadily commissioning artists to fill Cathedrals with narrative sculpture and painting. From the late 14th through the early 16th century realism in art was developing rapidly and one area of interest was the pursuit for more accurate representations of the human form. Artist such as Leonardo Da Vinci were well known for working in collaboration with anatomists to better understand and document the mysteries of the human body. This study was relatively limited as the bodies of the dead were considered sacred through the Church. Prior to the Italian Renaissance human dissection was widely forbidden and instruction was conducted through archaic and inaccurate texts created by Galen more than a thousand years prior based on dissection of various animals in place of human subjects (Friedman 2). The life of one anatomist that
stood out to me during my research and that was of Andreas Vesalius. Often referred to as the father of modern medicine, Vesalius challenged the previous conceptions of human dissection. By the early 1500’s only a few cities in Italy, including Padua, Bologna and Pavia, were permitted to conduct human dissection but were limited to a select number of bodies of recently executed prisoners (Friedman 2). This scarcity of resources for students led Vesalius to take it upon himself to overcome these constraints in creative ways. He often would acquire human corpses through the act of grave digging and robbing of gibbets for bones under the cover of darkness (Friedman 4). While knowing that this act was illegal, he continued to pursue his passion and advance his field of study. After graduating Vesalius became the head of the Department of Surgery and Anatomy in Padua (Friedman 5). It was during this time that he published the book known as *De Humani Corporis Fabrica* which continued to be the leading resource for medical research long after he died (Friedman 5).

When the story for the project was developed, Andreas Vesalius acted as the main reference for the protagonist, as well as inspiration for the theme of human dissection. I also wanted to draw visual similarities with the iconic biblical representations from my review for both composition and theme. This was so the audience would be able to more quickly draw connections with the narrative works of the Renaissance. For the narrative I chose to compare the persecution of Jesus with the dissection of the human body as an ultimate sacrifice towards the betterment of mankind. Personally I feel there are strong similarities between the two systems of belief as well as their discrimination of each
other. I wanted to depict how far people will go to when fighting for their beliefs under the persecution of a more powerful group.

In order to construct a poly-scenic composition telling this story in the style of a compressed narrative, five locations were selected based on their importance to the overall narrative. Using a vast 3D environment, each location was designed to capture a specific moment or series of moments. In the following sections I will first detail how each location appears to an outside viewer in an objective manner. Then based on these descriptions, I will discuss how the principles for compressed narrative have been implemented while designing each space.

First Location: The town square

The first location to be discussed is where I chose to have the narrative begin. During the initial viewing this location displays the public execution of three characters from a gallows in the town center. Behind the gallows stands an immense cathedral identified by its oversized entryway and colorful stained glass windows. The execution is in progress with a crowd of both young and old in attendance watching intently. Amongst the throng of people one character is apparent in his disapproval of the execution, by turning away as the final character’s stool is kicked away. Details about this character are vague when observing this event on its own.

Even though this is the protagonist, there are no physical attributes to signify this other than his reaction. This ambiguity is intentional for the purpose of engaging the
viewer. This was intended to cause the viewer to wonder what is going on and encourages investigation of the rest of the image in order to learn more.

The narrative presented in this location is a public execution of two anatomy students and their professor for dissecting a body of the recently deceased. The protagonist, whose name is Anura, stands among the cheering crowd witnessing the fate of his friends and teacher. Unable to watch, he turns away as the professor’s stool is kicked away. Now without the guidance of his mentor, Anura must make the decision as to whether the risk is worth the reward by continuing to study dissection.

This scene is visually central to all of the other events when the entire composition is visible at one time. However, the Reactive Frame limits the viewer from seeing any other event or location, having the gallows and crowd take up the entire composition. There is a limited amount of action occurring near the edges of the frame suggesting a representation of only a single event. Based on the organization of characters and line of action of their poses, the eye is directed in a triangular pattern through the scene. It begins from the base of the steps of the gallows to center of the middle character being hung, and down the body of the executioner traveling to the center of the protagonist’s body.

In order to help some of these details be perceived more quickly I incorporated stereotypical elements of the set and overall composition. First the usage of the gallows for public execution helps to inform both time period as well the stigma attached to it. The Cathedral was chosen as the back drop for the scene to help set the relationship between the execution and the characters.
Second Location: The Book Burning

To the immediate right of the town square the second narrative event is composed in and around an enclosed architectural forum. Just outside the forum walls a character clenching a book in his hands is attempting to hide in the shadows. Now noticeably later in the day as the sun has gone down and the only light comes from an unknown source inside the forum. To the right of the character a possible protest that is occurring can be seen through the archway entrance to the forum. There is a character standing on a pedestal preaching to an audience who are listening intently with piles of books littered around the crowd. The preacher is pointing towards the execution that occurred earlier in the town square. He and the rest of the crowd are bathed in a warm light emanating from the far right within the forum. Exploring further to the right it is revealed that there is a book burning occurring and it appears to involve the preacher and the group of followers. The books that surround the preacher’s feet are the same that are being thrown in the fire. This is the reason why the character hiding in the shadows, is protecting his book so intensely. By continuing further to the right the architecture abruptly ends, giving way to rough stone and dirt floors.

In earlier versions of my narrative I envisioned the protagonist developing a book, similar to the way Vesalius did the Fabrica, which he then passes off to a student before he is executed. In many ways the book was transference of leadership and knowledge from teacher to student. To keep the narrative streamlined both visually and thematically,
I incorporated a book burning event to suggest the presence of the text book, but omitted the detail of the character authoring it.

This event, unlike the town square execution, reflects the design of the Reactive Frame by revealing occluded elements using the motion of the camera. Where before, the viewer has the entire event visible, here information is more gradually revealed while moving from left to right. This is primarily achieved by using the architectural columns of the forum to provide gaps in addition to the more spread out elements of the event. This pacing of information is very important because it forces the viewer to take time and observe each element of the event separately. Because all of the information is difficult to observe at once the viewer must stop and observe. Furthermore, the compartmentalization of information helps to provide a sequential experience for the viewer.

*Third Location: Theft in the Catacomb*

When moving away from the forum and the book burning, the architecture abruptly becomes rough rock walls, giving way to a dimly lit maze of catacombs with corpses lining the walls. There is a lack of windows, the floors have become dirt, and water is pooling in recesses on the ground. Unlike the previous building spaces, the catacomb has far less action and at first only one character can be seen in the distance. This character holds a torch and appears to descending a staircase into the catacomb. As the user progresses further to the right the camera frames in closely to the character to see his expression and posture. The character appears tense and hugs the wall closely peering
into the catacomb from the staircase. As the user progresses to the right the camera withdraws from the character on the stairs and rounds a corner to reveal a character with a corpse in his arms and a torch on the floor. The character is struggling to lift the body from a lower compartment within the wall.

The transition from the forum to the catacombs is essential because it suggests that the events being presented may not be occurring simultaneously in time and space. Subsequently, the idea is that as it switches architectural space, the viewer is witnessing a new narrative event as compared to a continuous visualization of a single event. It is possible to come to this conclusion because even though the events are placed spatially next to one another, they do not always share environmental similarities. Some of inspiration for the transition style came from the earlier discussed work of Nagi Noda. Her use of cross-sectioned sets and weather gradations painted into the set backdrops are great methods for illustrating time change.

The catacomb scene is also meant to hint at the possibility that some of the characters, not just in this scene, might be repeated within the same space, representing a change in time. Unlike Nagi Noda, I chose to use more simplified method of poly-scenic character representation which I discussed in Chapter 2 on Narrative Compression. With Nagi Noda it is very obvious that each actor is the same character being represented over time by way of repetition through space based on the progressive posing of characters. Even with a reduction of characters the attributes such as hair style and clothing would still be enough to link the characters together. I chose to focus on linking the characters
together based on action and relationship between characters rather than physical identifiers.

For the catacomb scene I make it a little easier than other scenes to connect the character on the stair case to the character exhuming the body. First we have the torch carried by both figures. If the character extracting the body were to see the torch from the stairs then he would need to be reacting accordingly. Furthermore, if the character on the staircase was in search of criminals he would not be exhibiting the tentative posturing when entering the catacombs. The idea is that it should be noticeable that neither character is in acknowledgement of the other’s existence and subsequently be interpreted as the same person.

*Fourth Location: The Anatomy Theater*

The rough wall of the catacomb gives way to familiar architecture and the busy classroom of an anatomy theater. The visibility of the interior is limited by the outer wall of the anatomy theater. Through the windows a group of students watch eagerly as class takes place under the cover of darkness. The teacher stands center stage over a recently exhumed body that lays supine on a dissection table. Through the third window of the anatomy theater elements of dissent begin to exhibit themselves. A character can be seen running up the staircase at the back of the classroom. There is also a character that is being forcibly pulled down from the risers while others watch in horror. Through the last window a character is being chased and accosted by another with a nightstick, while a guard watches at attention from the doorway. Sunlight now pours in through the windows and entrance behind the guard. Outside the last window another character hugs the corner
of the building exterior tightly while peering around the corner into the open street. At the entrance to the anatomy theater, two characters are dragging a third down the front steps into the street which leads back to the execution in the town square.

Unlike previous spaces, the anatomy theater reveals a more apparent transition in time through the architectural space as it is viewed from left to right. This is primarily achieved through a method of nested framing by using the windows of the anatomy theater to create visual gaps between the events. This is the most complex of all scenes because it incorporates the transition of narrative events and visible time change within a single architectural space. There is a lot of importance placed on how each window is a separate composition on its own.

Conclusions to the Narrative

After exiting the anatomy theater, the images transition back to the main street where the execution is occurring. It is now visible that the narrative has come full circle and the execution can be identified as both the beginning and ending to the story.

Once the narrative has been fully revealed the goal was to be able to have the viewer connect the role of the protagonist to a single character throughout the image.

Due to the amount of ambiguity it is possible that there could be many varying perceptions of the narrative. For instance, the book burning could be viewed as a protest against the church and that bibles are being burned instead and subsequently a protest is occurring in response to the execution. The character which I referred to as a preacher could be viewed as a demonstrator since these two roles are very similar. On the other
hand, much of this ambiguity is on purpose because I am trying to create visual comparisons of the events to religious iconography. Subsequently, a preacher is a protester, a crucifixion is an execution, and a catacomb is a cave for the resurrection. This is important because the narrative can be very different depending on the viewer.

The protagonist of our story is a young anatomy student during the late Middle Ages to early Renaissance who is thrown into the conflict of having his fellow classmates and professor executed for their participation in the dissection of the recently dead. He must choose which path he will follow; whether to continue to pursue his beliefs and the study of anatomy, or submit to the church. He eventually chooses to continue his work in anatomy and subsequently is executed after transcending the role of a student to become the teacher of many future anatomists. History often repeats itself, and the cyclical structure of this narrative is intended to convey this concept.

_Use of Frogs as Archetype_

To help portray the reference to scientific dissection, I chose to use frogs in place of people as characters. I wanted to get the viewer to quickly make a connection between the characters and the study of human anatomy which was a main theme for the narrative. I feel that when most people think about their experience with anatomy classes and dissection the first thing that comes to mind is the dissection of frogs. It is often the beginner level subject matter for most biology classes.
The Narrative through a Reactive Frame

The reactive frame plays a large role in the presentation of this narrative because of how it affects the storytelling process. Unlike a traditional complex narrative that is presented on a single large canvas or paper, the reactive frame is meant to limit the visibility of the entire narrative. This concept is central to the design of the narrative because it would be very difficult to understand the narrative or where to begin if it was first viewed as a whole. The reactive frame is used to not only create specific compositions within the larger image but direct the viewer throughout the narrative gradually, scene by scene. This achieves a stronger sense of immersion because the composition always remains controlled as it moves through each event.

As the director, I want to make sure that the viewer experiences events within this large environment in a specific order. For instance, if the viewer were to begin at the catacombs, the narrative may read very differently. Furthermore, it may not induce the same amount of impact that viewing the execution first would, leading to less motivation to explore. To ensure the narrative always start at this point the reactive frame always returns the composition of the execution in the town square if the installation has not been approached by a viewer.

Spatial Organization

When organizing the placement of narrative locations I tried to make the reading experience feel more natural as the viewer moved throughout the scene. In some traditional compressed narratives such as Passion by Hans Memling (Figure 8) the
viewer, who is observing from an omniscient position in the sky, must travel through the cityscape in a complicated pathway in all directions. I chose to reflect the functionality of the reactive frame by placing the viewer at the same perspective as the events as they are occurring creating a more personal point of view. To accomplish this I had to keep all the locations on the same horizontal plane of elevation. As a result, the viewer is able to freely move left and right, laterally exploring the canvas without considering action on the vertical axis. This proved somewhat challenging with the catacomb scene transition since in actuality the location would be underground. I referred to the approach of combining spaces that may not be geographically close taken by Masaccio with the *Tribute Money* to make the catacomb location as well as others appear more continuous. I was also inspired by the use of lateral placement in Michelangelo’s *Original Sin, Adam and Eve in Paradise* (Figure 12), as well as Nagi Noda’s *Sentimental Journey* to utilize a more panoramic composition. Considering camera movement and development of 3D space, I attempted to capitalize on depth while maintaining simplicity as much as possible. I chose to place some events, such as the gallows scene, farther back in space than others, so that as the camera approached the viewer would be taken further into the environment, allowing them to focus more clearly on the details of the event.
Changing Architectural Space

One method that I use to signify a progression in time is through the transition to new architectural space. For example, when moving spatially from the town square to where the book burning is taking place there has been a transition to a new narrative event. The lighting has changed to signify it is just past nightfall and the change in venue is intended to help indicate that these could be the same characters but at a different time. Sometimes this transition is more apparent due to the abrupt change in the environment. For instance, when transitioning from the book burning to the catacombs, the smooth brick of the forum gives way to the rough, underground stone of the catacombs and the cobblestone of the streets gets covered by dirt floors. This transition assists the user in knowing that the current representations of space and time may not necessarily be occurring simultaneously. This same effect can occur at times even within a single
architectural space. In both the anatomy theater and the catacombs architectural spaces time progresses forward when spanning from the left of the space to the right.

*Technological Solutions for the Reactive Frame*

The main consideration when researching options to drive the virtual camera was to find technology adequate for the simple interaction and that it would be widely accessible. The experience was meant to be similar to viewing a painting or sculpture requiring only basic head movement to explore the image. The key is a reactive experience rather than an interactive one, eliminating the need for hand gestures and complex tracking of the body. During my review of available options it was vital to find one that would be highly responsive yet unobtrusive to the viewer. The system needed to be able to quickly recognize that a viewer was present and make the connection seamlessly with the virtual camera. Another important element of the experience was to handle regular switching of viewers. One intended method of exhibition was within a gallery space as opposed to only personal viewing. As a result, there was a strong possibility that a viewer will pick up where another has left off. During the review there were two main categories for tracking technologies based on whether a system of physical markers were used to track the movement.

At the beginning of the research markered systems of capture seemed more viable due to their increased accuracy in fine movement. It was important to capture subtle movement of the viewer because the experience was meant to match that of viewing an environment through a window. The more accurate the relationship between the viewer’s
head movement and that of the virtual camera, the more natural the experience becomes. Early on I was strongly considering the use of stereographic 3D projection and would inherently need glasses for the viewer providing optimal marker placement. One of the first methods of tracking I experimented with was using the Wii-mote game controller for the Nintendo Wii game system. The experiment was based on a project called “Head Tracking for Desktop VR Displays” (Lee). The Wii-mote functioned as the capture device for two LED markers that were attached to a pair of glasses worn by the viewer. The higher resolution of the Wii-mote camera allowed for smoother and more accurate recording of data over that of a common web camera. Another similar marker system I tested was the TrackIR 4 which used a larger number of markers in a predefined arrangement. The tracking style was more sophisticated and was able to record the rotation of the head in a full six degrees of freedom. This seemed like a good solution for allowing the viewer to explore a three dimensional space like a virtual environment. The problem was that the marker systems were often more obtrusive to the viewer’s experience. Something was always required to be worn on the head such as glasses or in the case of the TrackIR system, a hat with the markers attached to the bill. In the end, I found these methods to be moving further away from the goal of a simple and discreet method of tracking the viewer’s head movement.

When I was reviewing the possibilities of tracking without wearable markers I came across a simple solution. It was to use a web camera paired with a face detection algorithm to track just the head of a viewer. Besides being integrated in most personal laptops, web cameras are easy to acquire and involve only minor set up. The tracking
algorithm captures the appropriate data needed based on the interaction of subtle head movement. The algorithm also does not need any kind of calibration allowing the viewer to immediately interact with the artwork. This attribute made it an obvious choice for both a personal and gallery type exhibition. Another reason that the web-camera was an appropriate choice is make the material more accessible to a broad audience. One thing that traditional media thrives on is the ability to reach a large number of viewers at once. Since the tracking for the Reactive Frame is limited to a single viewer any additional audience members are at the whim of the one who is in the “driver’s seat” and no longer have the same personal experience. While it may not function as effectively for large groups in the same location the choice of using a web camera allows works developed using the reactive frame to be viewed on personal laptops and home devices.
Chapter 6: Conclusions

It was interesting to see how a cinematic approach could be taken to traditional storytelling in a single pictorial image. I enjoyed the challenge of trying to meld principles of single image narrative and 3D space together to create something new and different, while heavily referencing existing works of art that served as inspiration for the project. My background as a 3D artist motivated me to provide an outlet in which other artists can develop narrative without dependency on linear time-based media. I was inspired to challenge the conventions of current technology and discover new ways to think about the use of real time game environments for incorporating very subtle interaction. I found it both fascinating and challenging to strike a balance between guiding the viewer through the piece and allowing freedom for exploration. Creating an experience that gives the viewer the ability to become part of the image as well as the storytelling process by exploring the space of these renaissance style images. Allowing this freedom impacts the storytelling process, which requires more consideration of how events composed in a large, complex narrative.

By starting with static representation of narrative and incorporating technology in the form of the reactive frame, the piece creates an effective hybrid of references to classical painting and sensibilities of filmmaking. Utilizing a dynamic camera as a storytelling device within static representations added changing composition and guided narrative to the experience without the restrictive linear nature of film.
I feel that my understanding of the principles of compressed narrative made the design process smoother when developing the project and presenting the story with more clarity. Rather than relying on entirely new methods specific to the technology, many of the principles were able to transcend their original medium. This shows their universality for storytelling in static media. While many can remain unaltered because of my project’s similarity to traditional pictorial composition, the dynamic camera and subsequent spatial depth, a result of using 3D environments, alter the way the image is ultimately composed.

When developing with the reactive frame and moving within 3D space there were many challenges that prompted attention. For instance, the use of character posing to direct the viewer had to be tailored to shifting points of view. As the viewer moves through the space, the pose takes on a different silhouette and must be designed to work from multiple angles in order to direct the viewer. This difficulty was somewhat mitigated by the fact that I limited the ability to observe the space from all angles, retaining a more pictorial experience. This allowed me to use the element of shifting perspective to my advantage.

Just as the planets align to produce a lunar eclipse, the reactive frame moves through space and produces carefully constructed compositions at specific moments, prompting the viewer to stop. This observation is unique to the solution that I have used for the reactive frame and movement through a three dimensional space. This moment of alignment potentially becomes a new principle for storytelling in compressed narrative with the application of the moving camera.
Another challenge that arose during the process of creating this piece was how to manage the space between events. Dealing with the relationship between compositional and physical space proved difficult as a result of the dynamic camera movement, which can alter the pacing between events. When designing with a fixed composition, as with a painting, the space between events remains intact no matter how the viewer moves.

If I had the option to make improvements, one would be the clarity of the story. While I feel the piece is relatively clear in conveying the overall story and message there is a certain amount of ambiguity to allow for a more open interpretation of the narrative. While I did design the composition with a specific character arc present for the audience to follow, it was often overlooked or misunderstood by the viewer. I feel that more narrative events in this case would not be necessary, though I think revisiting some of the techniques to signify character reoccurrence would be useful.

Another potential improvement would be reevaluating the camera movement with regards to the transition between events. For instance, the spaces between the book burning and the catacombs, felt awkward to viewers. This was because the space was less rich with narrative information and what was intended as a quick transition could easily become a long dead space. Potential remedies include things like condensing the space or adding transitional events that are less complex, similar to the transition between the anatomy theater and the execution by having a character being dragged out of the building towards the gallows.

There are several other approaches that could have been taken as well. For instance, the use of subtle animation/motion, specifically for just the primary character,
would make it easier for the viewer to identify the protagonist in each scene, and would potentially make his intentions/actions clearer, as with hiding the book or withdrawing from the execution. Adding movement was considered in the project design, but a conscious decision was made to omit elements such as animation and sound to retain the feel of pictorial work and further differentiate the piece from time based media.

We have come to rely on and have certain expectations of modern technology such as movement, sound, and interactivity, and lose sight of the basics embodied in classical techniques. Technology can be used to augment and build upon the existing foundation of narrative devices that work, rather than overriding them. There are ways to incorporate modern technological advances such as 3d modeling and real time environments in ways other than the time based, interactive media that has become the standard. Attempting to create a hybrid and to work with new technology can be difficult, because the moment you begin to work outside the conventions of an established medium you open up endless possibilities and decisions must be made about where to draw the line in order to maintain the original intentions and avoid losing the starting point entirely.

While developing this project it was always important to refer to the principles of compressed narrative and the classical artworks that informed them. This is where the project began, and by continuing to remind myself that the storytelling process had priority over the technology, I was more able to maintain many of the original qualities of narrative that were influential to the unique characteristics of the project. By
developing a deeper understanding of established principles to help inform my design process, I was able to develop ideas that more effectively incorporated new technologies.
Bibliography


Lee, Johnny. "Head Tracking for Desktop VR Displays Using the Wii Remote."


