Fabricated Preservation

An Environmental Storytelling Experience

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Thesis submitted to the faculty of the Virginia Polytechnic Institute and State University in partial fulfillment of the requirements for the degree of

Master of Fine Arts
In
Creative Technologies

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December 12, 2019
Blacksburg, VA

Keywords: Environmental Storytelling, Virtual Reality, Photogrammetry, Immersive Environment, 3D Modeling, Conspiracy

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Abstract

“Fabricated Preservation” aims to push the boundaries with traditional theses, creating a multi-layered experience that blends fact and fiction through a performance that centers around environmental storytelling in virtual reality. The experience questions the balance of theatrical elements in traditional storytelling which forefront text and human characters over architecture, props, and environment, and critically examines how an environment can play a crucial role in a narrative. The narrative itself focuses on one question: if a genealogy company had access to past environments via time travel, what new information could we learn about our ancestors?

The normal perceptions of a “game” are challenged, introducing real world elements to trick the audience and subtly influence how they navigate a virtual space. A complex fictional character is introduced through the performance and developed through the environment, with the hopes that the audience will gain some emotion toward them: either connecting with the character as if they were a close friend, or feeling unsettled that they observed the character’s realistic personal space. This voyeuristic theme weaves its way through each layer of the storytelling, poking at the audience’s morals with the hopes that they will question the experience around them.

Above all, the main goal of Fabricated Preservation is to challenge the audience to mentally engage with the virtual experience, by paying attention to the details of their environment and constructing their own version of a narrative from those details.

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General Audience Abstract

Fabricated Preservation examines how an environment can play a crucial role in a narrative. An environmental story was created that centers around a fictional character, influenced by a close friend's life. Virtual reality was used to allow the audience to immerse themselves more within a virtual bedroom environment, using virtual props to convey the personality of the character. A fictional genealogy company called The Fifth Turning was also created to convey that environmental story through a different perspective to the audience. There are two main stories that go hand in hand with this experience: the primary story is the life of a college girl in the 1990s. The secondary story is of the fictional company, the Fifth Turning, which uses time travel technology to access the bedroom environment of the college girl to obtain more personalized genealogy information.

Acknowledgements

I would like to thank Zach Duer, Eric Standley, and Todd Ogle for their guidance throughout the development of the thesis, as well as their assistance through many issues that arose.

I would like to thank Thomas Tucker and Phat Nguyen for the many opportunities they gave and the knowledge I learned from them.

I would like to thank Jessie Mann and Jonathan Bradley, who were kind enough to lend their time and resources to the advancement of this thesis and the ideas it contained.

I would like to thank the Institute for Creativity, Arts, and Technology (ICAT) for access to the equipment needed to complete the thesis.

I would like to thank my mentor Max Bickley, who provides an invaluable perspective from beyond the school setting.

I would like to thank my fellow graduate and undergraduate peers, many of whom volunteered their time and energy to assist me with various aspects of development: Bridget Olson, Hannah Comstock, Brendan Casey, Connor Driest, Tianyu Ge, Emily Harris, Brady Blauvelt, Bethany Lavery, Noah Cook, Romantra Spence, Xavier Harrison, Aline De Souza, Jasmine Edison, Maureen Suess Saverot, Scott-Eugene Saverot, Rachel Oliu, and Tariq Rakha.

I would like to thank my parents for their understanding and support throughout this long journey.

Finally, I would like to thank Virginia Tech’s infinite Google Drive storage, because without it I would not come anywhere close to accomplishing my goal.

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Overview

“Environmental storytelling is the art of arranging a careful selection of the objects available in a game world so that they suggest a story to the player who sees them.” (Stewart)

Environmental Storytelling is a topic I’m very passionate about. While working on this thesis, I looked for opportunities in my life that could lend themselves to an environmental narrative. I thought about one of my close friends, and how her environment reflects her personality directly. With her permission and guidance, I decided to design a virtual bedroom based on her life.

This person struggles with borderline personality disorder (BPD), depression, and suicidal thoughts. These internal conflicts manifested themselves physically through her environment. Her apartment was extremely unique, with each item in it affected by these battles: every corner of every room told a story of loneliness, laziness, kindness, quirky passions, goofy habits, child-like imagination, and superb intelligence, all wrapped into one. All of the miniature stories contributed to an even greater theme of struggling for control of one’s emotions. With every single object I placed within the virtual room, her experiences were kept in mind. I also integrated my own experiences as well as the experiences of several other friends, in order to construct a uniquely realistic fictional person.

Environmental storytelling is generally used with regards to video game experiences, but can be applied to film and literature as well. It’s frustrating to me when a big box office film creates a beautiful setting that the audience only sees momentarily; or when a game creates detailed surroundings that the player immediately runs right past to fight a monster. I wanted to create an experience that places more emphasis on the environmental aspect of storytelling.

For my thesis, I created an environmental story centered around a fictional character that was influenced by my close friend. Virtual reality was used to allow the audience to immerse themselves more within the environment. I also created a fictional genealogy company called The Fifth Turning, to convey that environmental story through a different perspective to the audience.

There are two main stories that go hand in hand with this experience: the primary story is the life of a college girl in the 1990s. The secondary story is of the fictional company, the Fifth Turning, which uses time travel technology to access the bedroom environment of the college girl to obtain more personalized genealogy information.

Context and Background

Real Life Influences

Many political and societal references were woven into the story that exist beyond the room itself. These real events act as a foundation for the secondary story, contributing to the emergence of the Fifth Turning.

In 2008, America entered the housing crisis. This event kicked off what is known in the Strauss—Howe Generational Theory as the Fourth Turning, a period of destruction that often involves war or revolution (*LifeCourse Associates*). The theory states that American history repeats itself roughly every 80 years, cycling infinitely every 4 generations of people. The Fourth Turning is set to end around 2027 with another theorized golden age in society. This sociological theory was the initial inspiration for my fictional company, setting up a problem to be solved: If we can predict that a crisis will occur in the future based on these turnings, how can we prevent it? The Fifth Turning answers that call, seeking to break the cycle and stabilize society.

In October 2014, several scientists published a study in the journal Molecular Psychiatry announcing the discovery of two specific genes that are associated with violent crime (Tiihonen). The two genes were the MAOA gene and a variant of cadherin 13 called CDH13. The latter has previously been associated with substance abuse and ADHD. This scientific discovery serves as the reasoning behind the Fifth Turning's plan: the company believes that monitoring people with the associated genes will inhibit crimes from occurring, and in turn prevent a larger crisis from breaking out. Since the discovery of the genes were through DNA testing, the company would pretend to be a service that requires DNA in order to lure people in and obtain their genetic information.

In 2015 China began to quietly test a "social credit" point system, where the government monitors the behavior of its citizens and applies a reputation score to them based on their actions. This reputation score would give citizens either rewards or punishments that the government seems appropriate for their economic and personal conduct. A low reputation score could cause citizens (and their families) to be excluded from private schools and hotels, banned from travel, denied from jobs and loans, given a slower internet speed, publically shamed, and many more. Reasons for punishment were anything from "*bad driving, smoking in non-smoking zones, buying too many video games and posting fake news online*" (Ma). This point system was the inspiration for how the Fifth Turning was going to implement its own plan: by working with law enforcement and government agencies, people with the violent genes could be punished in society by restricting their privileges. Those punished by this system were less likely to obtain power in society, and if they resisted then police were given cause to arrest them.

In January 2019, the Beijing government made the test official, with plans to fully implement the social credit system by 2020 (Rechtschaffen). This confirmed that the Fifth Turning's idea could actually exist beyond being a hypothetical dystopian nightmare.

On October 21 2019, Apple CEO Tim Cook became chairman of Tsinghua University's advisory board (Jensen), establishing a public association between the tech giant and the authoritarian government. This fact influenced the portrayal of the Fifth Turning as a smaller company working under Apple. By being connected to the tech giant, the company has direct access to the resources it needs in order to enact its plan. Furthermore, the direct link between Apple and China allows the Fifth Turning to closely monitor how that system works, so that they may implement their own version.

Previous Works

Many of my previous works have direct connections to the theories and processes underlying Fabricated Preservation.

In the Fall of 2015 I created a virtual experience of a tightrope walk between two skyscrapers. This was my first hands-on experience with virtual reality, and the beginning of my fascination with the medium. In this piece I became well aware of the details of my surroundings, and was truly afraid that I could fall several hundred stories if I stepped off the tightrope. Creating my thesis using virtual reality is ideal for my goal, because I want the audience to be intimately aware of the details of their surroundings, which will be necessary in order for the environment to tell a story.

Following this I worked on "Blacksburg 16 Squares" and "Dig Hill 80", two research projects that provided a new perspective on storytelling that I never considered before: storytelling through the objects of one's environment. These two experiences aimed to communicate historical stories through technology, using authentic artifacts to tell about the people who interacted with them. In addition, Dig Hill 80 also influenced my decision to explore genealogy for my fictional company's service. The project's focus on reconstructing WW1 relics in 3D for virtual preservation, and to convey the stories of lesser known battles, introduced a fascinating analysis through technology. This historical storytelling through artifacts led me to consider how else we can explore our pasts with technology.

A few years later I had the opportunity to work on a research project with Facebook. Through collaboration with the Virginia Tech Computer Science department, the project focused on recreating a set of photorealistic rooms for VR visualization. It was during this challenge that I learned the full pipeline of 3D development: taking many photographs of an object at all angles, digitally stitching those photographs together to create a rough 3D model, cleaning up that 3D model, and placing the 3D model into a game engine for virtual reality. This knowledge would later serve as the technical foundation needed for me to engage in this thesis work at a capacity that I desired.

Video Game Influences

Several video games influenced this work through their groundbreaking approaches to environmental storytelling. The first is Journey (Thatgamecompany), a 2012 game which drops players into an open desert with no exposition or backstory. Players are left alone to discover how to complete the game, focusing on subtle environmental points of interest to guide them.

Without explicit directions, players are drawn to the only object in the far distance: a giant mountain with a glowing silhouette from the sun behind it. The wide open space of the desert was paired with tombstones and other small objects that form a trail, being illuminated by the sun and acting as beacons to investigate.This minimalistic approach to storytelling allowed players to feel like they were in control of the narrative by “deciding” to travel to the mountain. This technique of generating environmental points of interest influenced the placement of objects in my virtual bedroom: by creating dense pockets of objects throughout the room, the player is subtly encouraged to explore every corner. While approaching a pile of papers at the base of the bed, the player may then notice objects underneath the bed and lead them to investigate further.

The second game is called Gone Home (The Fullbright Company), a first person exploration game which places the player in an empty house to uncover a story about a family member. The game places a heavier emphasis on exploring the environment than most games do: every object in the house can be picked up and looked at. However, most of the objects that served to advance the narrative were just papers containing text. This traditional style of story presentation created an unrealistic scenario with countless notes scattered around the house discussing all the events, with a spoken narrator that would vocalize the words. Gone Home showed me the potential with environmental storytelling and inspired me to expand on what it was trying to do. I began to explore unorthodox solutions of conveying information in environments, such as using the dates on a medicine bottle or an unused laundry basket sitting next to a pile of dirty clothes.

The third experience is P.T. (Kojima Productions), a demo for a horror game that confines the player to a few rooms of a house. The objective of the experience is to escape the house, but whenever the player tries to enter another room they would loop back to the room that they came from. This gameplay mechanic was unique because it offered a placebo that gave the illusion of advancing through the environment without actually leaving a single room. Once players realized they could not change location, they began to focus more on their immediate surroundings in the room for further clues. It was this aspect that inspired me to implement a timer in my experience: by forcing the players to stay in a certain space for a period of time beyond what they’re used to, the players adapt to consider the current area they reside in.

VR Influences

In addition to video games, one virtual reality experience that approaches storytelling in a similar format as my own thesis is Mechanical Souls (Mourre). This live interactive event was set up at several film festivals, welcoming participants into a room specifically designed for a theatrical performance paired with a virtual reality film. The experience is divided into three acts: the first act is when actors greet the participant, the second act is the participant watching a VR film with the goal of understanding what events take place, and the third act is the participant discussing what happened with the creators. This three act structure draws many parallels to the four act structure I designed: the participant is greeted by the fictional company, the participant goes through a series of training webpages, the participant goes through the VR experience, and the participant provides feedback of how they interpret that experience. Mechanical Souls and Fabricated Preservation both attempt to pull a VR narrative into the real world to affect people’s perspectives, and increase their engagement with the work through interaction with the actors

and feedback. In contrast, Mechanical Souls focuses on AI based storytelling with different unfolding narratives while Fabricated Preservation focuses on one narrative with multiple interpretations. Their work uses cinematography to tell their story while my work uses a game engine with virtual assets. They also focus on traditional storytelling with visual characters paired with dialogue and events, as opposed to my work that focuses on the environment as a singular storytelling element.

Conspiracy, Genealogy, and Time Travel Influences

When tackling the narrative elements of the fictional story beyond the virtual room, three works contributed to its science fictional aspects.

The first is Assassin's Creed (Ubisoft), a video game conveying the story that all people share a direct neurological link with their ancestors. Fictional technology in the game is used to tap into the DNA of a person to view their ancestor's memories. Players jump into the mind of the ancestors, viewing the direct experiences that took place hundreds of years ago. This establishes a linear storytelling link that the audience can trust, seeing the memories first-hand as a source for information rather than being given biased information from someone else. By allowing the audience to believe what they see, we are presented with a missed opportunity: in Assassin's Creed, the fictional technology used to view the ancestors is provided by a fictional evil organization. This creates a conflict where the player cannot trust the organization itself but can trust the technology developed by the organization. For Fabricated Preservation, I sought to avoid that contradiction. By allowing the Fifth Turning to recreate the ancestor's environments, and providing the audience with client information passed through the company, the company remains in control of the information it provides. This indirect relay of information serves to provide another opportunity for the audience to question what's true and what's dishonest.

Steins;Gate (Hamasaki, Sato) is a Japanese animation centered around time travel. It introduces a unique approach to the paradox of time travel: instead of sending a person physically back in time, the person's consciousness is sent back. The brainwaves are encrypted into readable data, transmitted over lightwaves, and then unencrypted back into the person's brain at an earlier point in time. This idea limits the scope of time travel — being able to only go as far back as you are alive — but sidesteps the issue of having two versions of the same person existing in the same moment. By limiting how the time travel topic could be used, I was more engaged with the story's writing; it was introduced as an element of the plot rather than a solution to any contradictions in writing. Furthermore, the limited scope gave a believable grounding in science and the impression that this technology could be feasibly developed in the near future. This engagement and realism inspired my own approach to time travel: the glimpsing technology showcased by the Fifth Turning was built from a "limitation" brainstorming approach. By restricting what time travel can accomplish, I was able to creatively develop a narrative using the element without creating the paradoxes often found in other scifi interpretations.

The final work is Psycho-Pass (Shiotani, Motohiro), a Japanese animation that sets up a scenario where your DNA determines what you can and can't do within society. It goes further by allowing the government to monitor everyone's mental state and assign a "hue" value to each person: a clear hue means you are calm and happy, while a cloudy hue means something is

bothering you. If your hue level gets past a certain point then you are automatically notified to enroll in therapy, and if it continues to be cloudy then you are put on a “latent criminal” list where you are denied access to jobs and services. As a result of this heavy surveillance, society in Psycho-Pass is peaceful. The dichotomy of evil actions leading to noble results influenced the meta story that underpins the creation of the Fifth Turning: arresting people with violent genes before they commit any crimes, in an attempt to maintain a peaceful society. By introducing the theme “the ends justify the means”, Fabricated Preservation places the audience in an uncomfortable situation where it’s possible to sympathize with the perspective of the villains.

Set Design Influences

Several theatrical works served as inspiration to the design of the virtual bedroom and the presentation surrounding it.

The set design found in theme parks were important influences of environmental storytelling in my experience. Theme parks face a similar challenge to what Fabricated Preservation is trying to accomplish: “*how to bring people into their created worlds and keep them immersed and entertained*” (Carson, part 1). They establish a strong story through many techniques, such as filling every corner of the space with consistent imagery to reinforce the theme and fulfill the audience expectations. If you’re exploring a pirate ship, everything should look, feel, and smell, like a pirate ship. This idea served as the basis for a strong consistent narrative with my own story, littering each corner of the bedroom with artifacts that embellish her personality.

In addition, theme parks regulate how the audience interacts with their environment: “*We may feel in control of how we interact with our environment, but in truth we can be easily lead to a conclusion by having our primal understanding of the physical world played with*” (Carson, part 2). If a stone archway exists out in an open field, many passing hikers would be tempted to investigate the arch, and even possibly walk through it as if it was a door. This influence carries over to my virtual experience, keeping in mind how players will navigate the bedroom. The players can freely walk anywhere they wish in virtual reality, including through the walls, but a mental mechanism fights against their decision to do so. They naturally confine themselves to navigating the empty floor space, avoiding walking through large objects like the bed that fill up the room.

Wes Anderson’s set design was a big inspiration as well. He makes the environments surrounding the character a portrayal of that same character and that character’s personality (Gandra). This unique perspective of injecting personality into the environment, essentially transforming the environment into a character itself, encouraged me to reconsider each object and their placement in my virtual room. An example is the Magic: The Gathering cards found throughout the room: a neatly stacked deck of cards by itself may simply imply that someone bought a deck of Magic cards. But if the Magic cards are spread out and ordered correctly, then we know that the cards were being played. In addition, if there’s only one deck visible and no other signs of competitive play, we get the feeling that the cards were being played alone which implies a deeper sense of loneliness from the person who played them.

In his animated film “Fantastic Mr. Fox” (Anderson), Wes Anderson also required that the voice actors act out their scenes on a farm (Dudley). This allowed the voice actors to fully envelope

themselves in their characters, which translated to a more believable voice recording. Following this approach, I tried to capture a similar sense of atmosphere: I used virtual reality as a tool to fully envelope the audience within the environment, with the hopes that the audience will fully get into character and draw out more of the narrative.

Other Artists that Influence the Work

In addition to the previous influences across video games, VR, and film, several artists contributed to the thought process of my approach to environmental storytelling.

"A garment, an automobile, a dish of cooked food, a gesture, a film, a piece of music, an advertising image, a piece of furniture, a newspaper headline—these indeed appear to be heterogeneous objects. What might they have in common? This at least: all are signs…this car tells me the social status of its owner, this garment tells me quite precisely the degree of its wearer's conformism or eccentricity" (Barthes)

This quote by Roland Barthes, a theorist in semiotics, elegantly sets the stage for the reasoning behind Fabricated Preservation. Semiotics is important for obtaining meaning from the world around us and expressing the correct message in our culture. This technique of analyzing symbols, icons, and indexes, mirror the very core of my thesis: studying the artifacts of a bedroom as a stand-in for a fictional person's life and experiences. These signifiers play a necessary part in drawing out deeper meaning from the objects of my virtual room. The posters of popular bands on the walls represent icons that provide the room with generational context, as well as the fictional character's interests. The symbols of the geotechnical engineering papers scattered along the floor, as well as the text on the medicine bottles, convey written knowledge of the character's occupation and struggles with mental health. The most widely used type of sign however was the indexes; the disheveled clothing and unmade bed, half drank water bottles, and curtains blocking sunlight, all provide proof of the character's existence and interactions with the room.

Another influence is the concept of hyperreality coined by Jean Baudrillard, a French social theorist. This postmodern semiotic concept addresses the inability to distinguish reality from a simulation of reality. He proposes the idea that reality is simply something which can be simulated and copied, and that the hyper reality is more real to us than the reality itself (The Partially Examined Life). An example of this is a dinosaur, which we are given certain expectations of through modern film. We believe we know how these dinosaurs behave, without ever actually interacting with one; these digital creatures pretend to be a faithful copy of something real, but the original no longer exists. My thesis dips right into this territory, mimicking what other companies do at career fairs in order to appear genuine. The Fifth Turning doesn't actually exist, but their physical presence along with artifacts branded with the company's logo suggest otherwise. Career fairs are small simulations that attempt to convey what it's like to work at certain companies. The companies advertise an idealized interpretation of work life to entice college students to join, which twists the true reality of what it's representing. By mimicking the concept of career fairs, the Fifth Turning imitates an imitation to give the illusion of reality, which provides a pure simulacrum.

The final inspiration is the Yes Men, who raise awareness on many issues by masquerading as people or corporations they dislike. This culture jamming activist group goes to great lengths to get their point across, mimicking their targets with fake websites and elaborate public appearances. One example of their work was in 2009 when they impersonated the New York Post leading up to the United Nations Climate Change Conference. They created a fake edition of the newspaper, distributed throughout New York City by thousands of volunteers, and covered many articles featuring the urgency of climate change. Their idea of taking control of influential entities that refuse to pay attention to certain topics is similar to my own experience: hijacking the vehicle of job fairs to get people to pay attention to artwork. The Yes Men's work serves as an important inspiration for how I can push the boundaries with Fabricated Preservation in the future.

Research Methods

Creative Process

What really drove my work was an imbalance I noticed in the theatrical elements of traditional storytelling, which forefront text and human characters over architecture, props, and the environment. Movies and video games will often guide your eye specifically so that you can't focus on other stuff in the work. They demand the audience's full attention to simply absorb the events occurring. This has a negative impact on the environmental side of things, which takes a more passive and subtle approach to storytelling. The environment requires the audience to pause and visually explore the space, which can be difficult when a movie or game wants you to focus on a character talking or a gameplay interaction with an enemy.

Books however provide a more open option, dedicating paragraphs to simply describing the visuals of the environment surrounding the characters. This written exposition allows time for the reader to consider the scene itself and the story it provides. I believe that environments can be equally as important to other story elements in visual media, and as a result seek to create an experience that critically analyzes them as a standalone element. In my prior research, I discovered that people took VR environments more seriously when tasked with paying attention to their environment in a scientific way, and I want to reproduce that. I want to tap into the essence of written media and apply it to visual media, coercing people to actively think about the environment they're placed in without distractions.

To accomplish that goal of critical analysis through environmental storytelling, I focused on two methods that would support the experience I was going for. The first method was adding many layers of storytelling, to provide enough content and depth to keep people interested and engaged if they so desired. The first story layer consists of all aspects of the virtual room, including mental health inspiration and the thought process for the composition of the virtual objects. The second layer explains the background information on the Fifth Turning and the conspiracies it's associated with. The third layer explains the futuristic landscape that the Fifth Turning exists in. The fourth and final layer examines the presentation of the story to the audience and the perspective shift it provides.

The second method was narrative misdirection, which provides real world context and reward for choosing to engage with the story. This expands on the importance of the perspective shift found in the fourth layer, analyzing traditional storytelling experiences and providing solutions to carry out that change in mindset.

Background Development

Before diving into the layers of storytelling and narrative misdirection, it's important to detail the background development of how the experience came to be.

While investigating different avenues of environmental storytelling, I originally gravitated toward using crime scenes as a natural signifier of analyzing the space around us. To help guide the experience I researched forensic analysis, reading factual documentation on how to approach crime scenes (Penven), as well as fictional elements of good crime scene writing (Rodgers) found in novels. I learned what types of evidence is collected at these scenes (*Forensicsciencesimplified.org*), as well as what types of crimes were most common (*Fbi.gov*). From here, I began writing up possible scenarios that would fit well within a virtual reality environment.

The idea born from this was that players would explore an environment where a crime scene would take place in the future. They would enter the virtual space and have a limited amount of time to determine potential crime "triggers" that could cause the crime (such as a knife). When the time is up, they report their findings in order to prevent the crime from occurring. For the setting of the virtual space, I gravitated toward a fictional bedroom as the environmental catalyst of the story. Bedrooms are highly unique and contain a lot of personalization that lends itself well to powerful storytelling moments.

Testing the player after the experience was a difficult task. I considered multiple choice questions, but those are inherently biased (Blunch) and can lead the player to considering options they didn't originally analyze. Another issue that arose was how much information to provide the player beforehand: If I gave them the questions before the experience, it creates a linear and defined experience at the cost of influencing what they are looking for. This could create negative consequences of ignoring certain objects and areas of the room if they knew they were investigating a murder ahead of time. On the other hand, by not telling them anything at all, they could walk away completely clueless or misunderstand the scene.

These considerations led me to re-think the topic itself, and realize that a crime scene contradicted other interests in the environmental storytelling realm. The most important element was a desire to influence people to think carefully and investigate a space, and that extends beyond the field of forensics. During this time I was assisting in the Dig Hill 80 research project, reconstructing WWI artifacts in 3D for virtual preservation and to tell the stories of lesser known battles. This historical analysis through technology led me to consider the topic of genealogy as the foundation of my environmental story.

Genealogy companies rose to prominence by providing clients with access to historical ancestry records (*Ancestry Corporate*). Over time, many of these records entered the public database and forced these companies to adapt by providing DNA testing: information such as racial breakdowns and lineage locations were obtained through this. In present day, consumers can buy their own DNA testing kits and send off samples directly to labs for results. I began to consider the next evolution of genealogy within the ever-shifting technological market, and settled on the fictional future of time travel: if a company had the means of exploring environments in the past, what new personal information could we obtain about our ancestors?

The experience began to evolve past the boundaries of a simple VR game, with the details of this fictional company stepping into the real world. During my VR research with Dr. Wallace Lages, I noticed that the volunteer participants took the VR studies very seriously and engaged with it at a high level. This change in perspective while interacting with the virtual task contrasted with how most consumers playfully enjoy a VR game. This led me to consider how the presentation of the VR experience can play a role in how much the audience will immerse themselves in the task. As I iterated on versions of the virtual bedroom, I also iterated on bringing this fictional genealogy company to life so that it may fulfill its purpose of delivering the virtual bedroom. The decision to limit the company's technology to only "viewing" past environments served as a story mechanism to prevent time travel paradoxes, and as a technical mechanism to streamline the development of the room.

Originally the audience would play the role of employees at this fictional company, which provides them motivation to complete the task at hand. The issue with this however was it forced the audience to suspend their disbelief and pretend they were part of something they were not actually a part of. The decision to make the audience volunteers helping the company allowed the audience to remain in their own character and engage with the experience from an angle of sincerity. This idea was developed further to incorporate the real world setting of a college campus, and mimicked the ritual of career fairs that companies attend to hire students. This provided a natural motivation for the audience to participate and try their best to obtain a desirable outcome. Real people were hired to act as employees while providing this experience, allowing the company to have a physical presence and set a professional tone of critical thinking. The company's goals and interactions with the audience are expanded upon in the Layers of Storytelling section below.

A fictional client would provide a set of questions that they would like answered about their ancestor. These questions, provided via online document before entering VR, would serve to loosely guide the player through the environment. To avoid any answer bias, the questions were structured after popular personality tests such as Myers-Briggs (*Myersbriggs.org*) and Enneagram 9 (*The Enneagram Institute*). These tests provide statements in place of questions, offering 5 answer choices based on a "strongly disagree" to "strongly agree" scale.

While creating the physical aspects of The Fifth Turning, existing companies were mimicked in order to achieve the false impression that the company exists. The website aesthetic took inspiration from Apple's website ("Apple Homepage"), going for a sleek minimalistic design with a similar layout and draw parallels that the company is part of the Apple conglomerate. The Employee welcome video imitated Adobe's welcome video on Youtube (Nash), going for a happy upbeat tone that almost becomes unsettling. The t shirt design and merchandise design follows Microsoft's upfront style which portrays confidence in their name and logo (Norwood).

For the overall pacing of the employee training, I drew upon what I remembered from my time working at Harris Teeter: a streamlined online training program that went through the motions of educating new employees while simultaneously making it difficult to fail.

During the process of developing the virtual environment, I created a mini card game to organize the descriptions of objects within the room and analyze the narrative it provided. This provided a written list of descriptions for the objects, and allowed for a consistent storytelling reference which heavily influenced the final design of the 3D environment. Even though the cards weren't played in the traditional sense of a card game, creating them helped solidify a dependable theme to strive for. Details about this card game and the descriptions on the cards can be found in Appendix B at the end.

Layers of Storytelling

In order to keep the audience mentally engaged, I sought to create a story with enough complexity that would provide new information constantly throughout the experience. During the development of the story, it was important to address every plothole and make sure that all details were consistent with each other. This consistency would provide logical explanations to the audience and would lend itself to the believability of the narrative. Even if only 33% of the total narrative was provided to the audience, everything needed to make sense. This was a difficult challenge, as the story kept ballooning outward to account for new perspectives. This development led to the creation of 4 main layers of storytelling where each layer filled in the weaknesses of the other layers.

There was originally going to be the only one layer — the virtual room — but a lack of outside context caused a disconnect with the audience and weakened the overall experience. There was no reasoning for why participants were looking into the bedroom of this character; there was also no justification for choosing VR as the medium instead of representing the room through photography or a physical set. It was for these reasons that I created the other 3 layers. This first layer is told entirely in the headset in the virtual reality room, while the other 3 layers exist beyond it.

First Layer: The Room

The first layer was the room itself: the story of the girl living in an apartment in the 1990s. Many personal inspirations shaped the design of the environment. The 1990s time period was chosen as an opportunity to research and reflect on the decade I grew up in. The decade was far enough in the past to differentiate itself from the modern era, but not too far as to make it impossible to find relevant objects from that generation.

"*The best storytellers look to their own memories and life experiences for ways to illustrate their message*" (O'Hara)

As mentioned earlier, the story of the room drew upon a close friend's personal experiences being diagnosed with Borderline Personality Disorder (BPD). A mental illness support group called Out of the Fog defines BPD as "*A pervasive pattern of instability of interpersonal relationships, self-image, and affects, and marked impulsivity beginning by early adulthood and*

present in a variety of contexts" (Out of the FOG). This instability of relationships manifested itself within my friend's living space, and gave rise to a powerful story through her environment. This provided a great opportunity to support my research, and so with her permission and guidance, her personal struggles were portrayed through her own lens.

In addition to personal anecdotes I reached out to Jessie Mann: a Virginia Tech doctoral student researching Neurorehabilitation, with a Masters degree in Science, Technology and Society, and a Bachelors in Psychology. It was important to consult a professional on how to best convey a mental illness story to the public without overstepping any boundaries. Ms. Mann suggested making it clear that the story is a specific experience with BPD, and to avoid generalizing the mental illness as that would be disingenuous. By framing the mental illness as just an element of a story rather than the focus of an educational/health campaign, the topic no longer claims to be completely accurate and becomes much more accepted. It's simply scratching the surface of the topic.

She also suggested that being immersed in a virtual environment is a way to tell that specific story of BPD: "*We are exploring the boundaries where our personalities manifest themselves in the world through our bedrooms; the virtual room is a metaphor for getting inside someone's head and externalizing an internal experience"* (Mann). The objects in the room are environmental clues that inform the user about that symptomatology: they include subtle details for amorphous symptoms, such as having low lighting in the room as an indicator for lack of emotion.

Moving forward, this thesis serves as valuable research that can be expanded to opportunities in the mental health field (*CareersinPsychology.org*). If framed correctly, the research may help health care providers gain empathy for the diagnosis of BPD, as people with BPD are often discriminated against by doctors in the health community (Stobbe). There are also many grants available for storytelling (*Compton Foundation*), including mental health in storytelling (*Thefledglingfund.org*).

For the physical development of the room, the cutoff point for modeling objects was a set time frame rather than a total amount of objects. This was due to tight time constraints. Because of this unpredictability, a general plan for item placement was designed early on but a strict setup wasn't finalized until it was actually time to arrange the 3D models within the room. To prioritize the layout, I put myself into the headspace of the character as she first moved in and how she used the room over time. Each object was carefully considered and categorized into 5 groups based on stationary permanence: permanent objects she moves in with (bed), permanent objects she acquires soon after moving in (laundry basket), permanent objects acquired over a long period of time (posters), temporary objects that don't change location often (papers), and temporary objects that do change location often (clothing).

Rules were also created for placing each object in order to prevent common unrealistic results that are found in many video games. This was important in establishing a level of realism that mimics an actual space being lived in. By approaching the design of the room using these rules, the environmental narrative is highlighted. For example, one rule states that objects must be clumped together rather than being equally spaced around the room. This rule creates contrasting regions of the room, with empty spacial areas sitting next to dense spacial areas.

Not only does this create a more interesting aesthetic to investigate, but it also causes the viewer to consider why the objects were placed together. We naturally stack books or place them vertically next to each other for balance, and we throw clothing into a pile rather than separating each piece throughout the room. The full list of Rules of Realism can be found in Appendix B below.

Second Layer: The Fifth Turning

The second storytelling layer is the fictional company, which provides a reason for exploring the character's room: acquiring information about a client's ancestors through basic time travel. During the creation of the fictional story beyond the room, the topic of conspiracies were included as a plot device to increase audience interest. Conspiracies stimulate the mind similar to solving a puzzle due to our brains trying to seek out patterns within our world to survive (Inverse). They also focus on the possibility of censored or edited information leading to bigger discoveries: when you see something that you shouldn't have seen, that leads you to distrust everything surrounding that discovery. This plot device served as an important base to develop The Fifth Turning from.

As technology developed during the early 21st century, websites like ancestry.com (*Ancestry Corporate*) became obsolete. DNA testing kits became simplified and sold in retail stores across the nation, and historical records became open to the public for viewing online. One company, The Fifth Turning, sprang up in 2024 and figured out a way to stay relevant: using infant time traveling technology, they could obtain any information about ancestors that clients desired. First the client would give the company his/her DNA, as well as a list of questions they would like answered about specific ancestors. The company would then use state-of-the-art technology to send employees into past environments and find those answers. Due to the Butterfly Effect, Congress made it illegal to directly interact with anything in the past. The Fifth Turning complies with all rules and regulations, and as such limits employees to only "glimpse" into the past to obtain clues. They are simply spectators.

The Fifth Turning claims its DNA collection is necessary to locate the ancestor in the past, but this task is easily achievable with basic public records through Google. It's rumored that the company is building a database of the DNA it collects, but for what purpose is unknown. Several police and healthcare facilities list The Fifth Turning as an associated partner, causing some to hope that the company is developing technology that can improve healthcare through data-driven medicine (Rubin). An example of this is "*analyzing vast numbers of medical records and images for patterns that can help spot disease early and develop new medicines*" (Rahma).

In addition to the fabricated timeline, conspiracies were included within the meta story to create more engagement with the average audience member. The Fifth Turning intentionally has different organizational levels to mimic the structure of prominent conspiracies: the public website view that everyone can access, the employee view gained by participating in the experience, and the secret "no access allowed" admin page that can be found by clicking on a logo on the correct webpage. This secret webpage doesn't lead anywhere, but its existence serves as a stepping stone to critical thinking for those that stumble upon it. Beyond the company itself, references can be found that allude to The Fifth Turning being a child company under the fictional equivalent of Apple. Conspiracy theories often imply there are levels of

unknown from a higher order, and that the higher you go, the less morals you will find. I wanted to make sure I captured that essence, regardless of the actual intentions of the company.

The idea of providing editing information to cause audience members to distrust the company is shown in several ways for this experience: the company representatives in the Employee Welcome Video feel fake, forced to smile and read off a script of specific lines. The audience is told the questions that the client wants answered, but they never meet the client to verify that those questions are unedited. During the glimpsing trial, participants may find an iPhone X under the bed which contradicts the accuracy of the supposed 1990s setting. This implies that the simulation isn't completely accurate, and may even be staged. The idea of secretly testing participants within the bounds of a separate test invokes a nostalgic comparison to Aperture Labs in Portal (Valve).

A problem arises from the existence of time travel however; most companies in 2019's current capitalistic environment would be beyond excited to have time travel technology in their possession to help further their greed. In order for The Fifth Turning to resonate with the audience realistically, it needed further backstory with ulterior motives that would lend more support to the conspiracy angle.

Third Layer: The Futuristic Landscape

The third storytelling layer was the futuristic landscape in which this company existed. To create a believable political climate, I scoured the news for laws, scientific breakthroughs, and philosophical theories that could contribute to the emergence of The Fifth Turning. From there, a set of hypothetical events pushed forward a timeline filled with conspiracies. This layer was important in tying together a consistent narrative for the overall experience: by writing out every aspect of the story and answering all possible questions related to the plot, I was able to organize my thoughts and call upon consistent details to incorporate into the main experience as needed. This consistency was key in achieving a believable company presentation to the audience. Almost all of this story layer is implied in the experience rather than directly presented. More information about the hypothetical events contributing to the company's existence can be found in Appendix B below.

Fourth Layer: The Presentation

The final layer of storytelling, which ties together the entire experience, is the presentation to the audience. Conveying the mistrust and unsettling tone of the company was achieved through bad acting and providing false story clues within the virtual simulation. A simple iPhone X placed within the room throws the accuracy of the situation into question: an out of place object may lead the audience into believing that either the company can influence the past, or that the entire simulation is fake. Virtual reality was chosen to be the conduit that communicates the virtual environment, allowing the audience to immerse themselves by physically stepping into the room.

When exploring the best medium to showcase environmental storytelling, virtual reality seemed like a natural fit: even with simple graphics, many users experience a realistic sense of being transported into a different realm. VR is effective at creating an experience that can change the mental state of the audience, and is even used for psychological treatment as well (Lucci). The

goal was to create an experience where the player understands a story through the environment alone, and having full visual access to that environment through VR helps achieve this. Players can physically walk through the space, which provides a total-body experience that adds to the immersion of a virtual world and increases engagement. By allowing them to control their own movements beyond predetermined locomotion, they uncover the narrative from their own unique perspective that would otherwise be lost through traditional video.

Many VR works include low-poly objects - polygon meshes with a small amount of polygons - as a design element to convey their experience. I made the calculated decision to do the opposite: heightened realism with the 3D models. This was due to a side effect discovered while working on VR research with Dr. Wallace Lages. While preparing a VR recreation of the Rod and Frame test (*Psychology Concepts*) for Field Dependency, we noticed that the presence of cybersickness was heightened in users when placed in a more realistic VR setting. This sickness commonly occurs with virtual reality experiences due to a visual sensory mismatch; when a person's sensory channels defining body orientation and position conflict, the result can induce nausea, dizziness, and fatigue (American Physiological Society). The original Rod and Frame test placed users in an empty geometric room with no real world attachments; when we set up our own virtual room using 3D models from Turbosquid (*TurboSquid*) to create a living room space, the added sense of placement changed the results of the test. Users were more prone to cybersickness in this detailed room than in the simple version. There was not enough testing to form a scientific conclusion, however it was inspiration to create my virtual room as detailed as possible to yield a stronger VR experience.

Narrative Misdirection

The second method of enhancing environmental storytelling is with narrative misdirection. This is done by tricking the audience into perceiving the experience as something different than a standard game experience. There is a fundamental flaw with many virtual experiences: they are treated like games. The idea of interacting with a virtual world carries a certain stereotype that skews our perspective of how we act in it. This can be attributed to many pop culture uses of VR, glamorizing it in sci-fi movies like Ready Player One and the rise of video game companies adopting the technology at a consumer level. While this isn't necessarily a problem in many experiences, it does pose a problem to this research: users are less likely to approach the environment critically and without a preconceived perspective if the experience mimics a game too closely.

Video games place an emphasis on forcing the player to move from point A to point B with a satisfying gameplay loop (Bycer). Constantly moving the players throughout space and keeping them distracted with missions leads to a conflict with the environment: the idea of stopping and analyzing scenery goes against the player's internal instincts, which try to avoid failing the game. "*We may be transported into ever engrossing and elaborate theatrically lighted cathedrals, but the fact is, we are still simply killing each other… on many occasions I have been blown to bits because I dared hesitate to admire a beautiful piece of virtual architecture*" (Carson, part 1). This quote from Don Carson, a Senior Show Designer at Walt Disney, highlights the issue well.

In some cases, game developers attempt to bring attention to the virtual environment by

incorporating player interaction with it. This still leads back to a systematic gameplay loop however, and players adapt to it subconsciously. They become conditioned to respond in certain ways to these environmental gameplay elements: If there's only one interactable item in the video game, players automatically know that this item is important. If it wasn't, why else would it be interactable? Alternatively, if every item becomes interactable, like in the video game Skyrim, players begin to hoard all of the items just in case they need them later on. They pick up everything without considering the context of the item, and so the player ends up with over 100 wheels of cheese in their virtual storage.

This is also true for movies: movies are often designed to entertain the audience and keep them moving forward through the plot while cleverly guiding their eyes (Miller). Everything that the audience looks at, and the order in which they look at it, is dictated by the director beforehand. This is necessary for this type of storytelling in order to overcome the movie's limited time to tell a complete narrative. "The movie industry has created a very specific type of storytelling: faster paced, based on solid story structure, and, of course, emphasizing creative visuals" (Weiland). As such, "movies make it easier for us to just lean back and enjoy the show" (libmedia). This technique of directing the audience's gaze negatively impacts the story's environment, as the character's interactions take priority.

A unique difference between a video game experience and a film experience is that audience members are more lenient with allowing suspension of disbelief for film over games. "*We leave a lot of what we know about the real world at the door and allow ourselves to be completely transported by the events on the stage and screen*" (Carson, part 2). This ability does not transfer to virtual experiences though. When the audience steps into the virtual world, they transform "*from willing participants into shrewd skeptics"* (Carson, part 2). Without the use of outside elements such as cutscenes, game developers struggle with the challenge of giving the sense of life to the events happening around the player. Carson also touches upon this idea, mentioning that "*there are strict rules to our own real world environment, and we take these rules with us when we enter 3D computer generated ones*". This preconceived notion allows us to subconsciously write off virtual environments that don't match our expectations.

Contrast those types of media with reading a book: it's not uncommon for a book to spend 10 or 20 pages just describing the visuals of the environment alone, before moving onto any character development. It encourages the reader to pause and consider the details of the environment, rather than the environment being a background element that the viewer can easily ignore. One key difference is time: a movie is confined to approximately 2 hours to maintain interest, as it is designed to be consumed in a single interaction. A book can be however long the author intends it to be. "*A book is edited and crafted, but the writer is still working within an unlimited time canvas*" (Santos). This allows the author to include imaginative environmental descriptions that go beyond the limited scope of film.

This preconceived view can be countered by accompanying the VR experience with some sort of real world context to influence a player's perspective. When Lockheed Martin came to Virginia Tech (Korth), they offered a challenge to all students on campus: complete a series of their engineering problems correctly to open a mysterious puzzle box and win prize money. The flashy experience that Lockheed Martin provided was paired with a real incentive for people to participate to the best of their abilities. It was this idea that was inspiration for the presentation of my thesis. The Fifth Turning would visit Virginia Tech, offering its own challenge and rewards.

With real employees running the experience in a professional atmosphere, access to a booth with high end technology to use, and the reward of free merchandise and potential internships, the stage was set for a thoughtful attempt at environmental storytelling. The college students would be able to act as themselves seeking personal gain, and would be unaware of the stage they were on.

Materials

3D Pipeline

My general pipeline for the development of the room was using several design programs: RealityCapture Photogrammetry, Maya, ZBrush, and Substance Painter.

Every object in the room started out being scanned with photogrammetry to be most efficient with time constraints. For smaller objects, I used a lazy susan as a turntable combined with a camera on a tripod to speed up the process. For larger objects, I had to manually hold the camera and move around the object slowly, taking half steps with each photo. Unfortunately, many of the scanned objects ended up looking blobby and it was decided that each object would be 3D modeled by hand to maintain a high level of realism. The photogrammetry data was invaluable though: for the objects that didn't turn out well, I could still use the texture data it captured and the proportions of the scanned model as reference for accuracy.

A combination of Maya and ZBrush was used to 3D model each object. Geometric objects like books and electronics were built in Maya to maintain sharp edges and smooth surfaces, while organic objects like clothing were modeled in ZBrush. In Maya, the shape would be blocked out using extrusions from a base cube, followed by adding edge loops to generate a clean crease for each edge. Once the object was modeled, it would be uv unwrapped and then taken into ZBrush to generate a subdivided high-poly mesh for a normal map. Any subtle details needed such as seams and noise would be added to the high-poly mesh at this stage.

For the objects with acceptable scan data (usually the organic objects), I would edit and clean them up in ZBrush. The object would first be Dynameshed to close any holes in the geometry, and then ZRemeshed to reconstruct the polygons of the object to have a logical flow to them. I would then alternate between projecting the original scan data onto the mesh and ZRemeshing the mesh to achieve a low-poly object with accurate silhouette. The overall goal for polygon count was between 500 and 4000 polygons depending on object complexity. Once the object was prepared at its lowest setting, the object would be subdivided to over a million polygons in order to generate its high-poly form. Both forms would be exported, with the low-poly mesh being brought into Maya for uv unwrapping.

With the objects modeled, they were then brought into Substance Painter for texturing. The low-poly version would be imported into a new file and the high-poly version would be baked onto it. By layering different aspects of preset materials (such as wood, concrete, cloth, etc) onto the object, I can recreate the object's colors, roughness, and metallic properties that will then be converted into 2D maps. If needed, photos of the object would be imported into the file to directly paint on specific textures such as logos and text. Certain complex objects needed ID maps to be generated for them, by bringing their uvs into Photoshop and using the paint bucket

tool to block out different materials using colors. This abstract colored image allows Substance Painter to selectively apply different material properties to different parts of the object seamlessly. Since the final product was to be visualized in virtual reality, I kept in mind those hardware limitations and opted for each object to have only three 2048x2048 maps: base color, normal, and roughness/metallic/occlusion.

Throughout this design process, I used these techniques and programs to achieve the 3D models I desired at a high quality. This process is not cheap however, and required many GBs of data to accomplish. During the photogrammetry part, I took a total of 16,648 photos of 135 unique objects, which amounted to 88.51 GB for the photos alone. Various design files from Maya, ZBrush, and Substance Painter amounted to roughly 140 GB. In addition, 40 GB of design files were corrupted during a routine backup and needed to be recreated later on. In total, I used close to 270 GB while creating this virtual room.

Unity vs Unreal Engine

When determining which game engine to develop the experience with, it was important to consider the main underlying benefits: free to use, VR support and documentation, and realism for environmental storytelling. With Unity and Unreal Engine being the two biggest free-to-use game engines, the final choice was between them. Research was done on both engines and small test builds were created using both tools available (Quixel). It was determined that overall, Unity is easier to work with and has a much more extensive web of VR support. In contrast Unreal Engine has a better out-of-the-box lighting system and material system, which lends itself to more realism. UE does have VR support, though not as much as Unity. The choice was made to use Unreal Engine to fully support the environmental storytelling immersion, even though it meant jumping through more hoops to set up virtual reality with it.

HTC Vive Pro vs Oculus Quest

To provide the best experience that builds upon a futuristic theme, two main virtual reality headsets were considered as the conduit of time travel: the HTC Vive Pro and the Oculus Quest. When researching the benefits of each major consumer headset, these two stood among the best options available (*VERSUS*). Originally the Vive Pro was the planned device to develop the experience for, because it gave a higher screen resolution and frame rate for an immersive experience. When performing small tests with the Oculus Quest however, I found that it was much simpler to work with and wasn't dragged down by the lighthouses associated with the Vive. The frame rate was an issue with both devices, but the lower resolution on the Quest wasn't noticeable. The unexpected benefit of the Quest was that being completely wireless gave it a futuristic feel, which pushed it over the finish line and became the chosen headset to develop for.

Physical Props

In addition to the software side, certain ritual elements were necessary to convey the illusion of a real company visiting a college campus, in order to frame the audience's perspective of the VR experience. Taking inspiration from companies that visit Virginia Tech's own career fairs, as well as research online (Flax) that discusses successful career fair booths, many of those elements included: a company website, booth, banner, employees with t shirts, business cards, and merchandise to give away. These elements were mimicked appropriately, hiring a

programmer to code the website and an artist to design the banner. Student volunteers wore matching t shirts with the company logos to signify knowledge and authority. Each volunteer was given fake business cards to hand out in case any participants had genuine interest in the company beyond the afternoon experience. The merchandise was decided to be stickers with the company logo, pens with the company logo, and candy to offer a small variety to those that participate. Each one of these elements was important in establishing a credible atmosphere for an unknown company, in order to solidify the illusion and sell the VR experience.

Technical Issues Affecting Creativity

Throughout the production of Fabricated Preservation, there were many technical issues that arose and challenged its development.

Originally, a program called Agisoft Photoscan was used to process the photogrammetry data. The speed and quality was very poor however, taking days to process a single object and providing an unrealistic result. By switching to a paid program called Reality Capture, the scanned meshes improved greatly and were created at a fraction of the time. Taking at least 100 photos per object and deleting any blurry photos before processing helped increase overall quality as well.

UVing objects for a game engine requires a different approach than UVing them for a rendered scene in Maya. Unlike Maya, in a game engine the object's uvs must fit within a 1x1 uv grid and must not overlap. By testing the overall development pipeline in the beginning, this issue was noticed early on and a plan was established to avoid any damage from this pitfall. All 3D models that were planned to be created now had to be approached in a different way because of this.

Some objects were originally created with polygon counts that were too low for the game engine to render well. Automatic tools like ZBrush's ZRemeshing can achieve very low poly results, but at the cost of bending the polygon faces. When an object is put into a game engine, those bent polygons are triangulated automatically. If the triangulation cuts the polygon incorrectly, the result can show either a concave or convex surface when the other is desired. This effect extends beyond the silhouette of the object and can give strange results for texture and normal maps. As such, some objects needed to be subdivided one level before importing into the game engine to reduce the chances of this occurring.

Creating a clean normal map for a low poly object was a painful process of trial and error. Each polygon on an object needed to pack a lot of visual information into their uv space accurately, so it was crucial that none of the uvs were distorted: mistakes and artifacts would be clearly visible otherwise. As such, several of the automatic tools that were relied upon for past projects could not be used here. Instead of allowing ZBrush to generate the uvs with UV Master, the uvs were cut manually in Maya. Normal maps were created in Substance Painter with ZBrush's low and high subdivisions exported. Even if the object was originally created in Maya, it was brought into ZBrush to establish a subdivision connection; there is an option to "smooth" divide an object in Maya, but doing so for a high poly version is not recommended as it changes the fundamental structure of the object. When the object was comprised of multiple pieces, it was important to have the correct settings when baking the normal maps so that each piece was treated separately. Having the correct naming and organization of the pieces (such as a piece1_low.fbx

object and corresponding piece1_high.fbx object) allowed the program to process it accurately and efficiently.

While modeling objects for the 3D room, I would create batches of objects and then back them up on Google Drive once each batch was done. Every object I created had many heavy files associated with it (ZBrush file, Maya file, Substance file, high poly obj, etc) and so each batch of objects would be 20-60gb of data. During one upload batch, I initiated the upload and then moved the objects on my personal laptop to a different folder. Doing so broke the file path upload connection to the Drive and corrupted the uploads, although no notifications or warnings were given. After the files were “uploaded successfully”, they were deleted from my personal laptop, losing 40 GB (and two weeks of work) in the process.

The objects I modeled were limited to objects that I could find in real life. It was an important objective to recreate actual items that exist to be as realistic as possible for environmental storytelling. The disadvantage of this decision was that the final objects of the virtual room were limited to what could be borrowed from friends and family. This was especially awkward for clothing, where it was difficult to find articles that fit the 90s time period. Because of this limitation there were fewer models of clothing than originally planned, and the overall design of the room had to be frequently updated to address what was available to me.

During the final stage of production where the room was created in Unreal Engine and built for the Oculus Quest, it was discovered that there were several key differences between computer game development and VR game development. Special post-process effects that worked on a computer screen were unsupported in VR and had to be removed. Normal information displays such as HUDs were only rendered through one eye on screen and had to be reworked into the 3D space. The preview lighting during development in the game engine was not an accurate representation of the lighting when built to the headset. When enabling HDR settings to compensate for the lighting difference, the overall framerate suffered as a consequence.

Final Product

The Fifth Turning is a fictional genealogy company that visited Virginia Tech on December 12, 2019. During that time, the company advertised its futuristic Time Glimpsing technology: an invention that allows participants to see into past environments using virtual reality. The company mimicked the signs associated with real companies visiting a college campus, in an attempt to blend in and not raise suspicion. The overall purpose of this was to convince students that the company was legitimate in order to influence how they perceived the virtual reality experience provided.

The company set up a career fair booth in the Multi-Purpose room of Newman Library and welcomed anyone who was curious to stop by. Outside of the room was a table where two students sat, hired to be fictional employees representing The Fifth Turning. They wore Fifth Turning t shirts, handed out free company merchandise (stickers, pens, candy) and gave an introduction about the company to any nearby people interested. A company banner hung from the booth.

The experience was framed as a company visiting Virginia Tech as part of their “career fair tour” across the US, where they stopped at various colleges looking for good applicants to join the team. Students at Virginia Tech could participate in a “glimpsing simulation” set up by the company to help understand what the company does. If a student did well, it was implied that the company may later contact them with employment opportunities, though no personal information was actually recorded.

Students that wanted to participate were given a temporary ID number that represented them. They used this ID to access various parts of the experience, such as the company’s online training and the client feedback report through the company’s fictional website. They were given an iPad to begin training. The training consisted of several web pages of information: a cheesy video introduction, health and safety handouts to accept, client information, and a preview viewer of the virtual room they will later explore.

Once they had gone through the necessary steps, they were ready for the VR glimpsing experience. This consisted of using an Oculus Quest to explore a virtual room made in Unreal Engine. They had only 3 minutes to explore, with the reason being that it takes a lot of power to run time travel-based technology. This time was chosen due to being a popular length for maintaining engaged viewing on Youtube Videos (Lee). With the Oculus Quest, the players explored a virtual environment that conveyed the story of a person in the past. While exploring, they kept in mind the questions that the client wanted answered pertaining to the ancestor. The virtual room itself was constructed using a combination of Photogrammetry, 3D scanning, retopologizing, and hand modeling objects from the real world.

After the VR experience ended, they were given back the iPad and asked to provide their feedback to the client. The questions they answered were multiple choice, based on online personality/psychology tests. Once the participant answered the questions, they were free to take some of the free merchandise and were told that those who provided good responses may be contacted in the future.

Findings and Interpretation

I felt that certain aspects of the experience were lacking and could be improved upon, but the overall work has a lot of potential. The theatrical element didn’t come together until a week before the presentation, which limited the amount of time to advertise the company. Employees rehearsed their parts beforehand, but did so separately, which caused confusion in the experience while transitioning between employees. Actors that were part of the later stages in the experience (such as those in charge of iPads and Oculus Quests) assumed that participants were already given certain information by other employees. This caused certain key elements of the story to either be repeated by multiple employees, or in some cases left out entirely. I felt that the environmental story within the virtual room was strong however; I stayed true to capturing the essence of my friend’s lifestyle, and several participants commented on how the room felt like an actual livable space.

During the actual experience, all 10 people who participated had some connection to the host (friends, family, friends of friends). The experience was aimed at unaffiliated college students,

and failed to hit that demographic. Several strangers peaked their heads into the exhibit space, curious about the event, but none of them entered. This can be attributed to two main reasons: the first is that the experience had no presence beyond the room; aside from a few emails going out on Virginia Tech listservs, the experience was not advertised. The second problem was that the event took place within a closed space and did not fully convey an inviting atmosphere.

The feedback from those that did participate however was insightful: the presentation of the company was compelling but also confusing. The actors did great in maintaining character, but the information they presented would occasionally leave gaps in the company narrative. One participant mentioned how she initially believed it was a real company; it wasn't until she was putting on the headset was she told that the company was offering internships for completing the task, which confused her. All 10 participants completed the client survey after the experience, and for almost every question there was clear agreement with the answers. On a 5 choice scale from "strongly agree" to "strongly disagree" for each question, at least 5 participants chose the same choice for each question, and 2-3 more chose a similar choice (such as "agree" and "strongly agree"). This indicates that many of the participants came to the same conclusions about the fictional character's personality through her environment. The main goal of Fabricated Preservation was to challenge the audience to uncover the narrative through the details of the virtual environment, and I consider this consistency to be a success.

To improve upon the experience, there are a few changes that would be made based on the aspects that fell flat during presentation. For a second installment, the company would be given social media accounts to advertise themselves months in advance. This would establish an internet presence and gain a small following that would help lend credibility to the fictional company. The experience would also be scheduled during an actual career, to blend in with other companies and allow college students to walk up to the booth freely in an open public setting. The employees would have more time to practice their presentation of the company together, making sure that the entire experience conveys all the necessary information needed to keep the audience following. Finally, the employees would be more aggressive with inviting individuals passing by, encouraging them to stop and engage with the booth.

Future Work

The experience from the very beginning was designed to have room for expansion. Given the scope of the project paired with limited time constraints, it was important to modularize the design so that it could be improved upon in the future. There are four key advancements that will be focused on for subsequent installments; the thesis simply laid out the initial foundation.

The first improvement is through sense engagement. Currently the experience involves sight with VR, hearing with headphones, speech while talking to employees, and the occasional physical touch with iPads outside of the testing area. This can be expanded to include more physical sensations and smell as well. For example, having a fan blast the audience while they are preparing to use the VR headset can give the feeling of a cold sterile laboratory setting. Having a heater turned on near the audience while they are glimpsing into the past can add to a warm, comfortable nostalgic experience. The musty smell of old books, damp clothes, scratch-n-sniff stickers, and other 90s memorabilia can help sell the tone.

The second improvement is through replay-ability: more variations of the room as well as more unique rooms further down the line. Variations of the room can be achieved with clever coding of item placement to rearrange things procedurally. By combining this technique with a larger pool of questions from the client, each play-through can be different and tell the story of a unique fictional person. The creation of new 3D assets would lend itself to new rooms to work with, and would be combined with new client questionnaire templates that match the personality of the room appropriately. Ideally, letting the player choose between several clients at the beginning of the experience would help the experience unfold naturally and not feel forced. With enough asset generation, stronger themes within the rooms can be generated, such as a clear sense of which season it is and recent weather trends (shown through the types of clothing around the room and accessories such as umbrellas).

The third improvement is through interact-ability. One issue that arose during development was how to convey subtle information to players without being biased and influencing their perspective. To this extent, I believe that two additions would enhance the experience while allowing the freedom for detective work: picking up objects and an in-game Google app. Being able to pick up any object in the room would not only increase engagement (proven in Job Simulator by Owlchemy Labs) but would also allow players to see information on parts of objects normally obstructed from view. In the initial room, I made careful consideration to make object text visible to players so that they can read them and acquire important contextual information: medicine bottles turned toward the center of the room, pet adoption papers in a spot where they can be read, etc. In some cases it was difficult to juggle providing important information while also providing a realistic room layout. Having the ability to pick up any object alleviates that design concern and provides more space for players to discover the labels with their own investigations. The in-game Google app, similar to the cellphone in Grand Theft Auto V (Rockstar Games), would allow players to access a virtual search engine while in VR. This would allow them to dig deeper and obtain extra information about things they are curious about, such as potential reasons why someone might be taking a certain type of medicine.

The final improvement is through expanded use of technology and software to achieve the above goals more effectively. One expansion would be incorporating Unity's de-lighting tool for scanned objects to remove shadows from the scanned textures. Throughout the development of the thesis, several objects were scanned for textures but could not be used because of the harsh shadows embedded onto them from their real world surroundings. This would allow those scanned textures to be used for a higher level of realism in the virtual environment. Another expansion would be incorporating Substance Alchemist into the design pipeline, a relatively new software that allows detail maps such as roughness/normal/height to be generated from a single texture map input. Depending on the accuracy, this would speed up the texturing process exponentially and eliminate the "guessing" of material properties in Substance Painter. There are many programs out there that specialize in specific things, and it would be interesting to establish a pipeline that blends them all together.

Conclusion

Fabricated Preservation focused on conveying a narrative through a fictional environment in virtual reality. This decision to highlight environmental storytelling stemmed from personal interest, and sought to create an experience that placed more emphasis on the environmental aspect of storytelling. The narrative itself drew heavy inspiration from a close friend with Borderline Personality Disorder; her environment reflects her personality directly by communicating her unique experiences through the objects in her bedroom.

A fictional genealogy company was created to share the environmental story through a different mindset. The company visited Virginia Tech and showcased the environment as a simulation of ancestry, offering tangible rewards to those who showed interest in participating. The actual experience failed to connect with the target demographic of random college students; the people who did participate however gave positive feedback about the employee acting and that the virtual room gave a realistic sense of an inhabited space. The responses from the finished surveys indicate that all participants engaged with the work seriously, with many of the questions having a clear majority answer.

There are still improvements to be made with Fabricated Preservation, but the first installment laid out solid groundwork for future iterations.

Appendices

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Appendix B: Documentation

Environmental Card Game

Below is the link to the rules and card descriptions for the environmental card game that was created during early development.

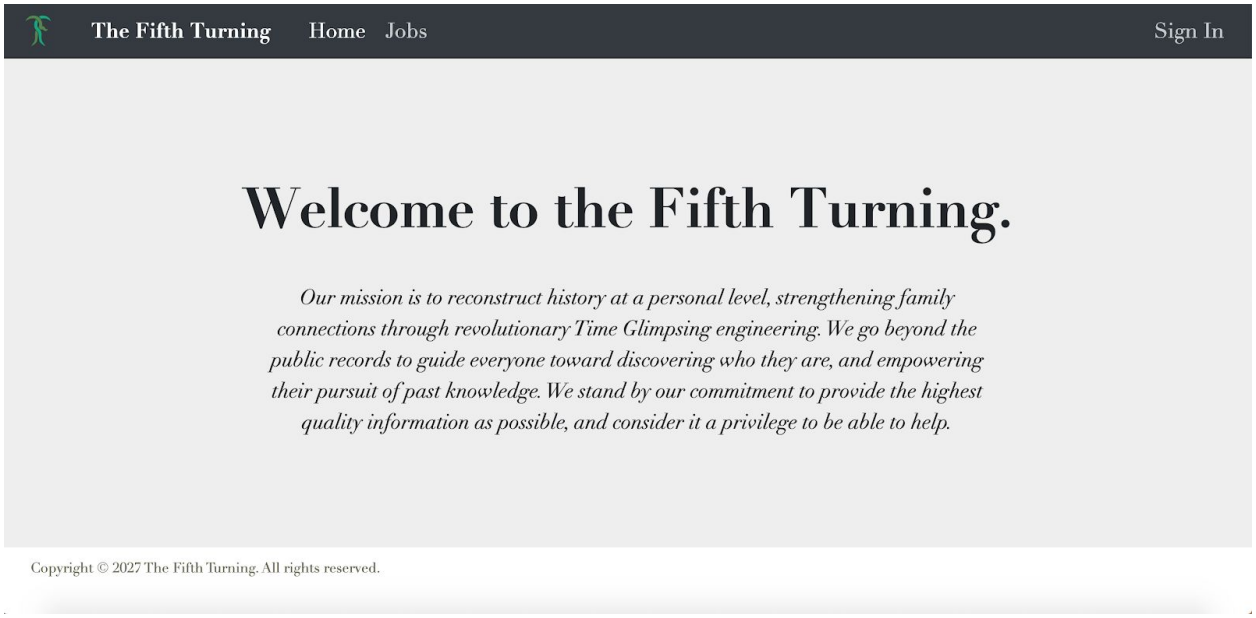
https://drive.google.com/file/d/1WFg-EKN-jm0nrlHOa9hMcI12WzImUz6a/view?usp=sharing

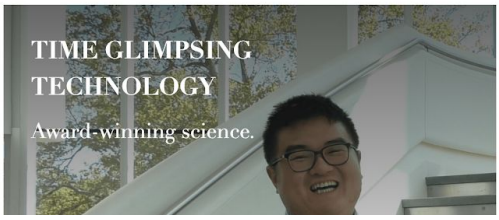
Website Information

Below is the link to the Fifth Turning website that was presented to the audience during the experience. If you wish to access the Sign In page and follow the experience that participants went through, the username "**198410**" paired with no password will grant you access. In addition to the link, several screenshots of the website have been included in case the website goes down.

Link to website: http://reverb.group

Screenshots:





The Fifth Turning Home Jobs

Oops.

The page you're looking for could not be found.

Return to home

Sign In Return to Fifth Turning

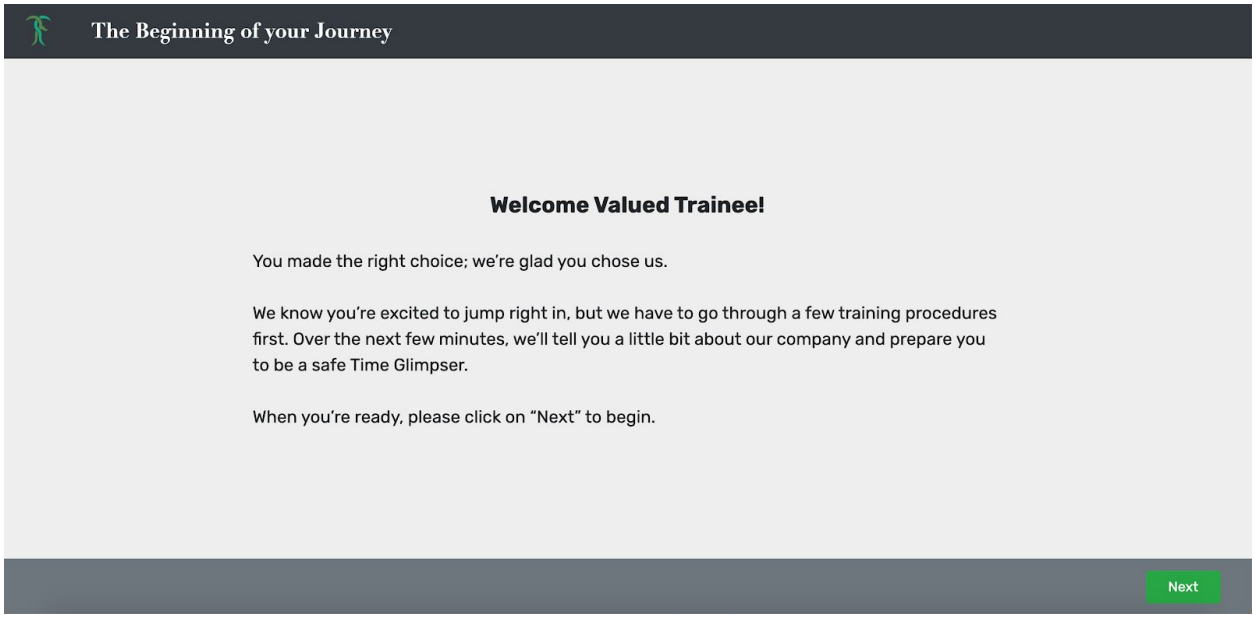
Please sign in to access the employee services.

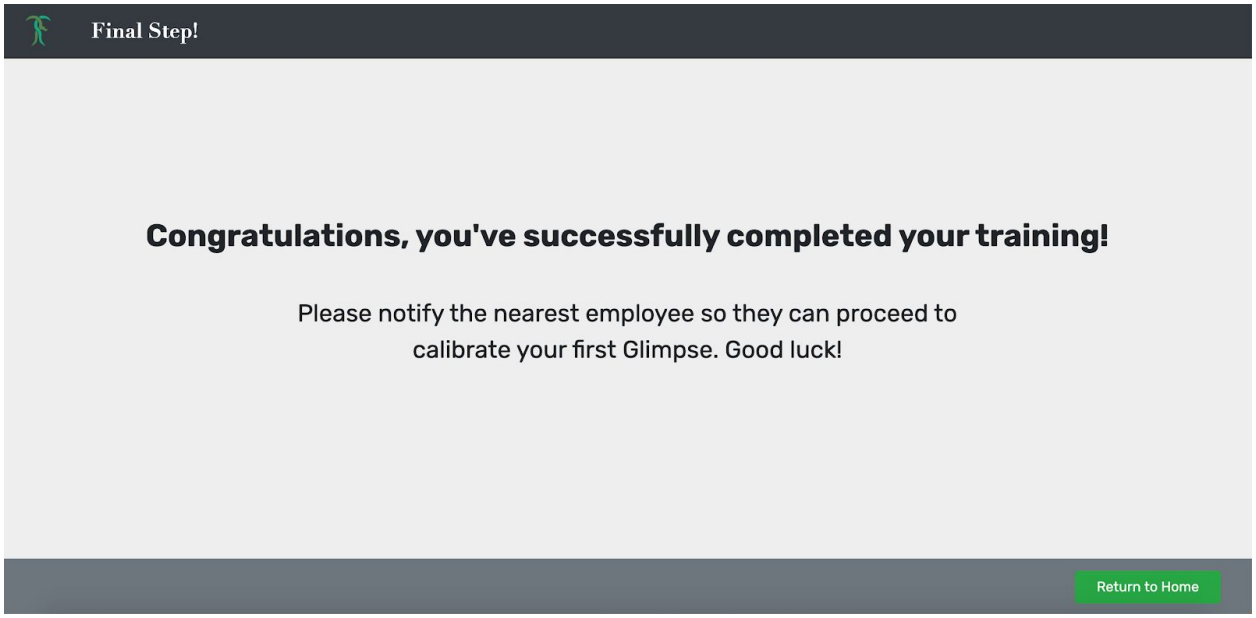
Username

Password

Sign In

Guests and trainees should use the temporary ID number provided to them for the Username box.





Employee Welcome Video

Below is a link to the Employee Welcome Video, as well as the script that each employee read while filming.

Video link: https://vimeo.com/375424920

Script:

- Hi. Welcome.
- Welcome to the Fifth Turning: the number 1 world leader in genealogy services. We're glad to have you on the team.
- Here at the Fifth Turning, we strive to reconstruct family history at the highest quality for our clients of all walks of life.
- We believe that understanding what our ancestors were like, and creating an unbreakable family connection, extends beyond the public records that our competitors provide.
- Over the past 3 years, we've quickly earned our place in the hearts of millions around the world, and have expanded our work to locations in 37 countries, countless school systems, historical ventures, and private inquiries.
- It's part of our core values that define us: we believe in guiding each individual toward discovering who they are, and bringing us all closer together as a family
- Thanks to groundbreaking progress in Time Glimpsing technology, as well as the recent DNA Security Act passed by Congress, we can finally provide answers to the real questions that our clients want to know.
- Questions such as: What was their personality like?
- What was their daily lifestyle?
- Did they have any regrets?
- We work around the clock to provide the most heartfelt services to as many people as possible.
- After the video ends, your first contract will be given to you by your designated manager, as well as basic training instructions for lab equipment use.
- We're excited that you're joining our family, and we hope you're just as passionate about the opportunity you've been given. It all starts and ends with you.

Health and Safety Documents

Below are the links to the Health and Safety documents for iPad and Oculus Quest, given out during the presentation of this experience. There is also the Glimpsing Safety document, warning viewers about the associated risks of using the company's fictional technology.

iPad Health and Safety:
https://manuals.info.apple.com/MANUALS/1000/MA1848/en_US/ipad-pro-11-ipados-info.pdf

Oculus Quest Health and Safety:
https://www.oculus.com/legal/health-and-safety-warnings/?locale=en_US

Glimpsing Technology Health and Safety:
https://drive.google.com/file/d/1eWILsWueEqhPRmyjfXFzX8mc5edUaXBr/view?usp=sharing

Client and Target Character Bios

Below is the client/target document created in conjunction with the room experience, provided to audience members through an iPad to give the impression of a realistic company hiring employees.

Client Information Sheet:
https://drive.google.com/file/d/1T5Cj5JoTajudVeokG7v1PlThDoXCUdRG/view?usp=sharing

Below are the client questions I created for the experience, to provide a goal for the audience to keep in mind while exploring the bedroom. I aimed to create questions that did not have an easy yes/no answer, nor were clearly defined. I hoped that the questions would provide enough flexibility that two different people could walk away with completely different answers that were both valid interpretations. I based the design of my questions on the online personality tests such as Myers-Briggs and Enneagram 9, opting for an unbiased multiple choice questionnaire that would both streamline the experience and provide a variety of responses. The questions are phrased in a way to allow the users to respond on a 1-5 scale: Strongly agree, Agree, Unsure, Disagree, Strongly Disagree. Many of these statements are taken straight from the official descriptions of each personality type, done so intentionally due to their precise wording to convey certain meanings.

The statements I used can be found here:
https://www.enneagraminstitute.com/type-descriptions

Client Survey Questions:
https://drive.google.com/file/d/13hTJ9YRpcOegQbxfsI3ATfxPLiM4R3HP/view?usp=sharing

Fictional Timeline

Below is the fictional timeline I created during the development of the story. This pertains to the Second and Third storytelling layers involving the background information of the Fifth Turning.

- In 2020, American democrats regained control of the House, Senate, and Presidency. This ushered in a wave of legislative social changes such as the DNA Security Act. Passed in 2021, the act highlighted the flaws of using Social Security cards as a main form of identification and instead required companies to keep a database of their employee's DNA. This opened the floodgates for future jobs and services to rely on DNA.

- The genealogy company Fifth Turning is established in 2024. On the surface it provides the opportunity for clients to "glimpse" into the past using early time travel technology, giving patrons access to personal ancestry information. The company is part of a larger conglomerate under the fictional equivalent of Apple. Apple has continued to evolve its technology, expanding its reach into many areas that require DNA collection to provide products and services.

- The information obtained by The Fifth Turning is sent back to Apple without customers' knowledge or consent, and is screened for the potential of them committing violent actions in life. They look for MAOA and CDH13 in the customer, as well as past family history on crime. Customers that meet these qualifications are put on "Potential Criminal" watch lists that are monitored by police, job employers, and insurance companies. Similar to China, people on these lists have a harder time building credit and are the first to be interviewed when a crime occurs in a nearby area. These lists cause customers' lives to be more difficult, which encourages the victims to turn to theft and other crimes to get by, and provides justification to the police to then arrest them.

- The end goal is profit through stability: The Fifth Turning and Apple want to break the generational cycle defined by Strauss-Howe's Generational Theory, which states that a country-wide crisis will occur every 80 years. Their belief is that by arresting potential criminals before those people get into positions of power, a future crisis can be avoided and America will enter an equilibrium state of peace. Apple has become the capitalistic entity of an Iroquois mind: considering the future with each decision and hoping to thrive across several generations (Indigenous Corporate Training Inc). This extended period of prosperity is designed to help Apple yield higher profits on the luxury items they sell.

Rules of Realism

Below are the Rules of Realism that were developed during the placement of items within the virtual room. These rules were used as a guideline to ensure that the virtual space felt realistic and lived in.

- No object shall be placed at a perfect 90 degree angle. Humans are not perfect with aligning objects to walls: they are crooked slightly because of our own flaws in perception and how we indirectly move objects slightly when we interact with them. As such, every object was placed in such a way to imply how it was used and the angle that it was used from. For groups of objects, such as a deck of Magic cards or cat food in a bowl, scripts were used to randomize the rotation of each object by a few degrees.

- Every object needs purpose. Every object is used for specific reasons and would only be used in certain parts of the room. A TV would not be placed on the floor if there is desk space available to place it on. This rule seeks to address the issue where video game rooms are often filled with random reused assets that don't make sense.

- Objects are clumped together rather than equal spacing between them. 3D artists often try to give the illusion of a full room by spacing objects out, but this isn't realistic. Objects tend to clump together as we push them around and use them, creating dense spacial areas alongside empty spacial areas. We naturally stack books or place them vertically next to each other for balance, and we throw clothing into a pile rather than separating each piece throughout the room.

- Objects need to be affected by gravity. Certain objects such as clothing and papers were given ncloth simulations to accurately deform to their environment.

- Objects need contextual redundancy. Certain objects in the room are unique and realistically singular, such as a TV. With other objects such as Reese's Pieces wrappers, it's normal to have multiple copies since many people eat several at a time.

- Each object should not only contribute to the main story of the room, but also sub-stories as well. Groups of objects shared their own mini narratives to provide layers of environmental storytelling. The arrangement of beanie babies on top of the dresser and the Magic The Gathering cards laid out mid-game are examples of this.

- The room must abide by safety regulations and include all foundational elements of a real space. This includes but is not limited to: smoke alarms, cables and cords, wall bevel, outlets, thermostat, and heater. Countless architectural visualizations have beautifully rendered objects such as televisions… that aren't plugged into anything.

- Each object must adhere to the passage of time, as not all objects entered the space simultaneously. The posters are an example of this: the early posters were given plenty of space to hang using her favorite color of thumbtacks, and the later posters brought in were crammed into empty spaces using whatever thumbtacks could be found.

Company and Merchandise Images

Below are images showcasing the various aspects of the Fifth Turning's marketing and merchandising.

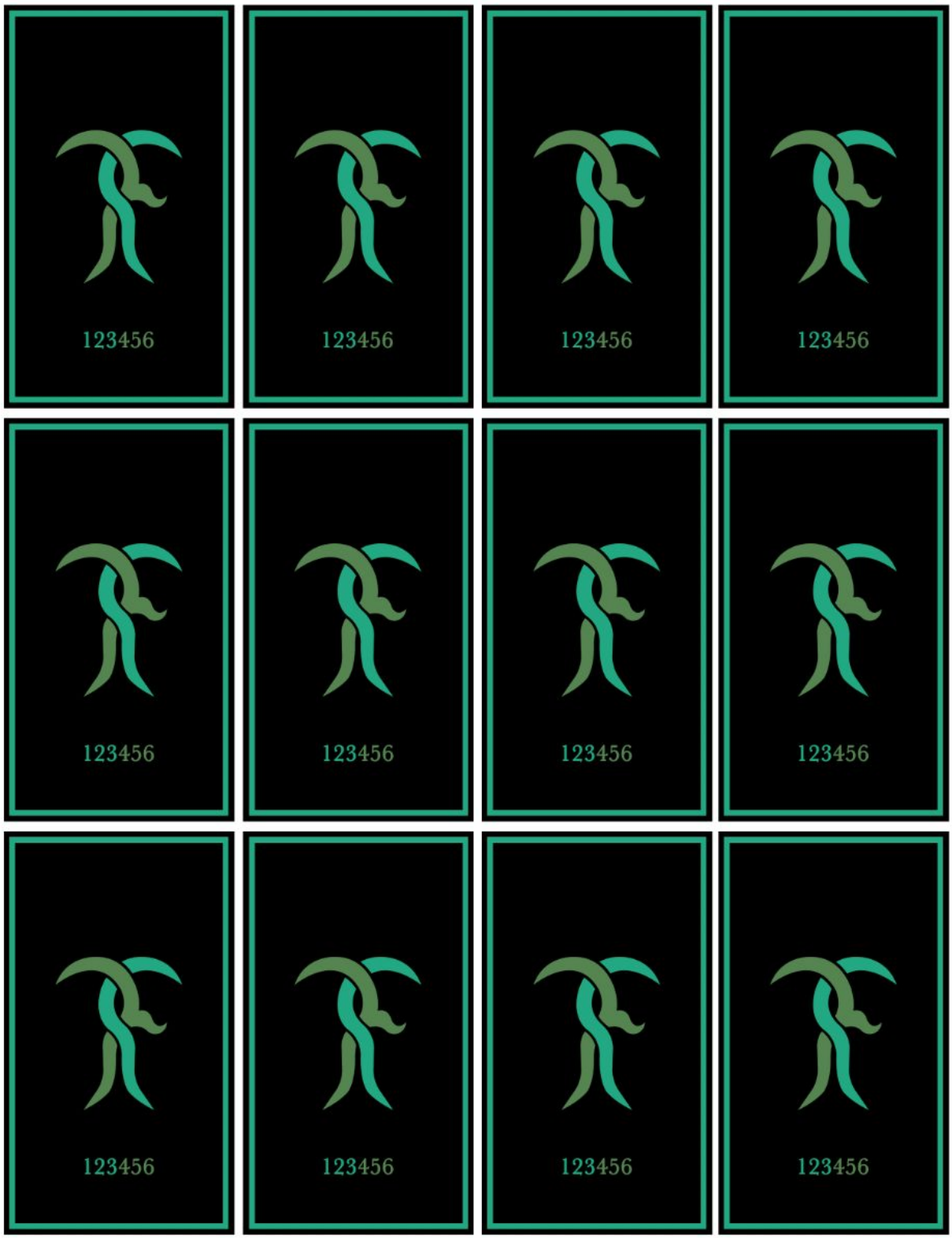
Logo:

Banner:

Pens:

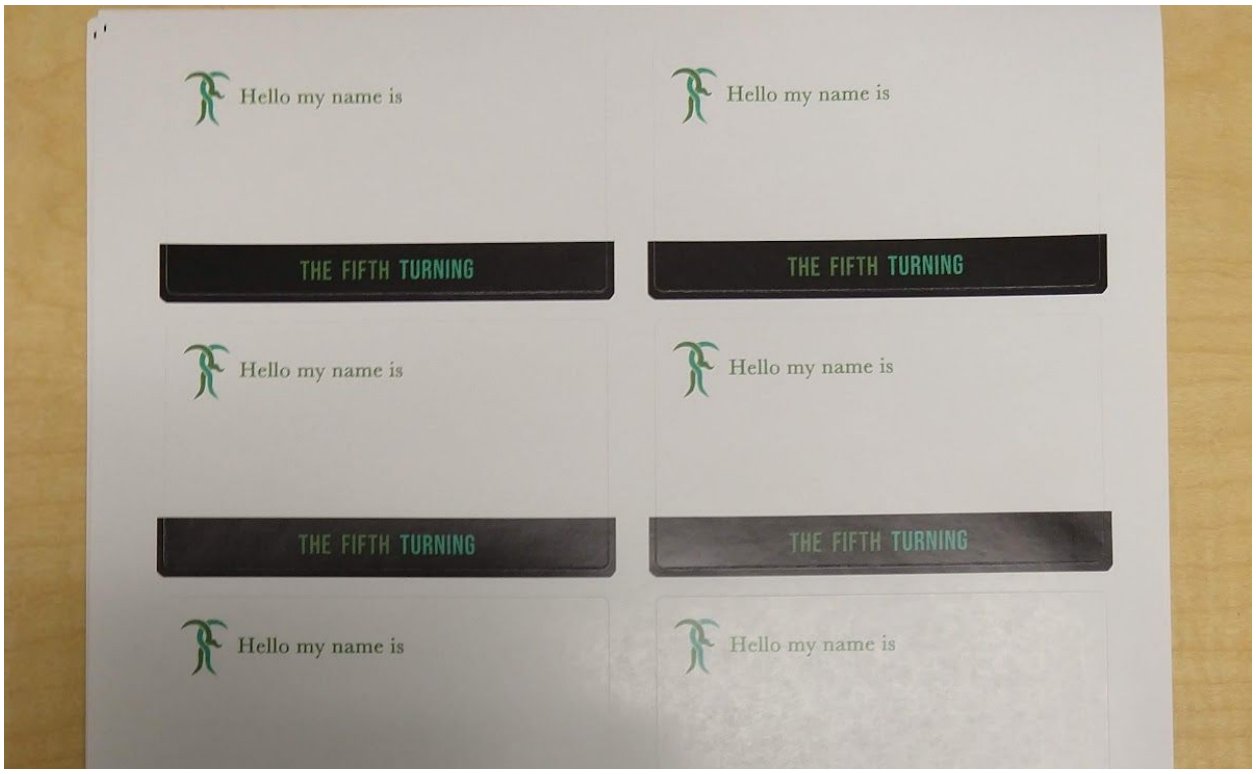
Stickers:

Temporary IDs:



Fake Business Cards:

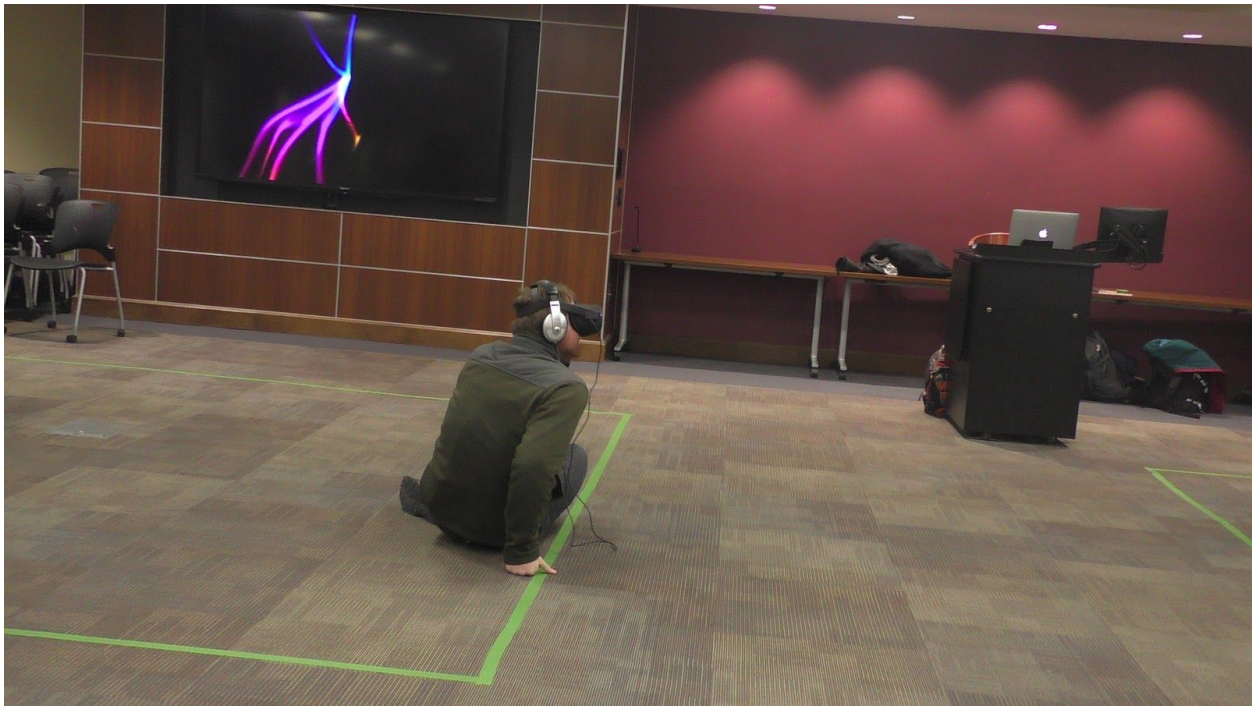
Nametags:



T Shirts:

Final Event Photos

Below are photos taken of the event on December 12, as the company gave its first public showcase.




THE FIFTH TURNING

Unreal Engine Build

Below are the files that contain the full Unreal Engine build of the virtual room. This can be downloaded and installed on any Oculus Quest. Other VR headsets may be able to run the build, but some elements of the experience may be broken.

apk file:
https://drive.google.com/file/d/1NoxbX7aEGQ-UyJkPhtM960VmwbAO0GMH/view?usp=sharing

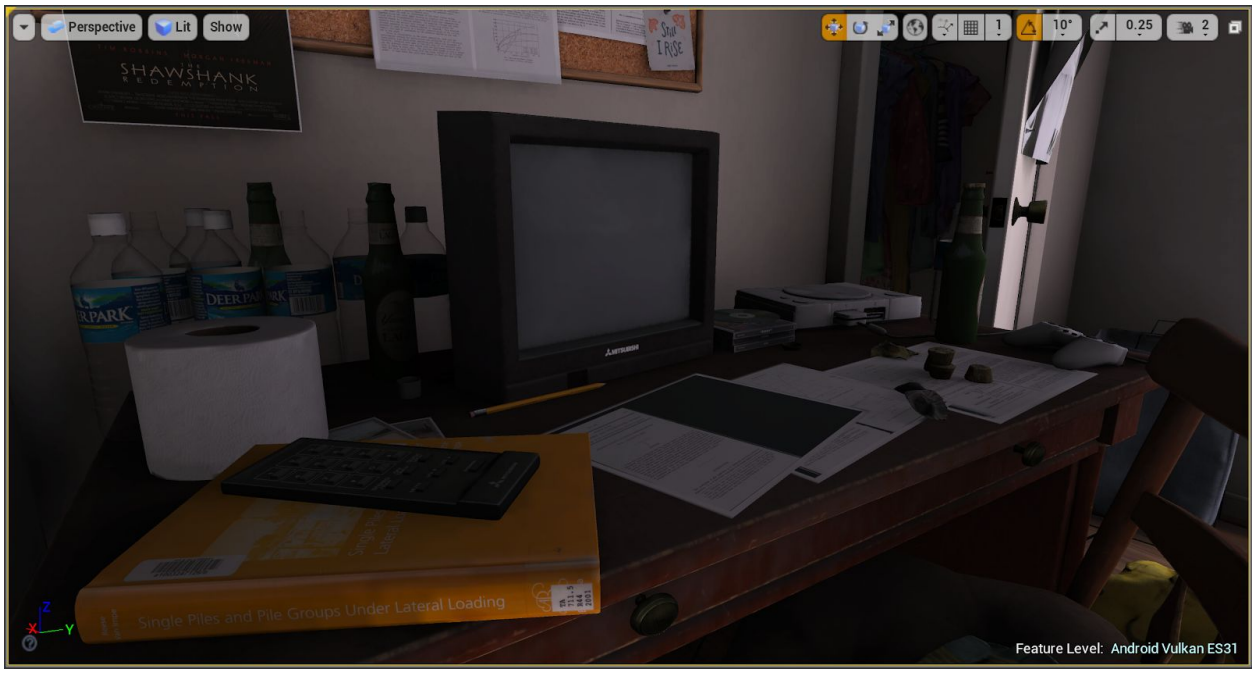
obb file:
https://drive.google.com/file/d/1Rww_9npOR0laTMO8PkJrf1MkqWb4Jo9G/view?usp=sharing

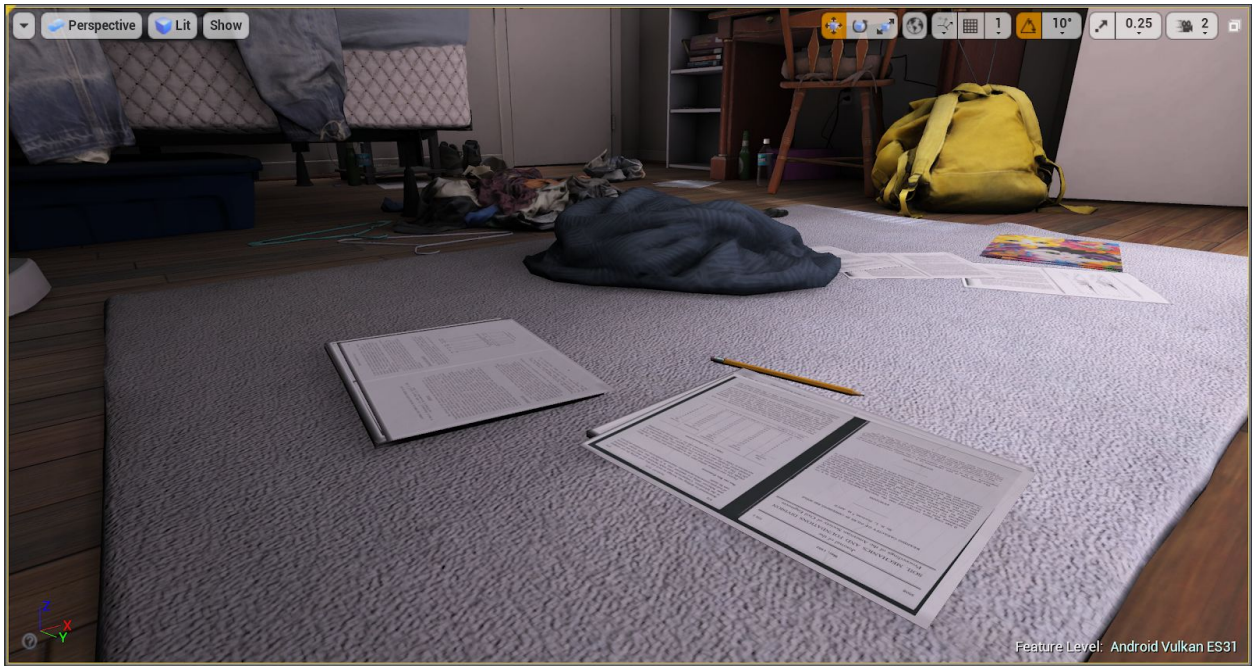
In addition to the files, here are several screenshots of the room in case the build is broken:


Perspective
Lit
Show
10°
0.25
2
NAUSICAA
Feature Level: Android Vulkan ES31


Perspective
Lit
Show
10°
0.25
2
Feature Level: Android Vulkan ES31


Perspective
Lit
Show
10°
0.25
2
Feature Level: Android Vulkan ES31


Perspective
Lit
Show
10°
0.25
2
SHAWSHANK
REDEMPTION
Single Piles and Pile Groups Under Lateral Loading
Feature Level: Android Vulkan ES31


Perspective
Lit
Show
10°
0.25
2
Feature Level: Android Vulkan ES31


Perspective
Lit
Show
10°
0.25
2
Feature Level: Android Vulkan ES31

Appendix C: Artist Statement

Stories are what give our world significance. What drives me as an artist is combining art and technology to capture that significance. Bringing art to life for the enjoyment and critical thinking of any individual excites me. I paint my brush through Storytelling, Modeling, Animation, Rendering, Game Design, and Teaching. The world of 3D art inspires me to consider the physicality of each piece and forces me to contemplate the balance of realism and abstract. I achieve these goals by pursuing creative and technical interests, studying a large variety of topics to keep my imagination bursting at the seems. My curiosity propels me to actively pursue any opportunity to gain more skills and knowledge.

My art is for those that want to challenge themselves and follow their dreams. My art is also for those that may need a little guidance to get where they're going. Every pitfall that I come across and troubleshoot, I incorporate into my art so that others can learn from my mistakes. I share with those around me to synergize and build them up to reach new heights.

This Research was paid for and published by The Fifth Turning.