May 2020

How the Advancement of Computer Graphics has Improved the Representation of Monsters in Cinema

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How the advancement of Computer Graphics has improved the representation of Monsters in cinema

A Dissertation
Presented to
the Graduate School of
Clemson University

In Partial Fulfillment
of the Requirements for the Degree
Masters of Fine Arts
Digital Production Arts

by
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May 2020

Accepted by:
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Abstract

Monsters, creatures, and beasts have always been a part of any civilization's culture. Through documentation and stories passed down from one generation to the other, we as a society have seen a huge variety of monsters in literature, arts, and movies. The correlation between society and its fascination with monsters stems from fear. Fear is the overall driving force for the creation of all monsters in every form of entertainment because of humanity's attraction to the weird and abnormal. Often either a fear of science or a fear of one's self, there is a monster that is created that corresponds. From Dracula to Godzilla, these monsters represent fear that were among the people of their time. Monster representation in film provides a surreal way to present those pure, exotic, and frightful themes in a way that the audience can appreciate. Computer generated effects have advanced significantly toward photo-realism, improving the impact of monsters in stories, folklore, and myths, portrayed in cinema.This thesis will discuss the origins of monsters; their impact on art, literature and early cinema; and how the visual effects industry reshaped and strengthened the representation of monsters in movies.

Dedication

I would like to dedicate this entire MFA paper and degree to my mother. At a young age she risked her life to come to America and get a better life. She raised 3 children and made sure we received an education and opportunities many from Vietnam could not get. With her support I accomplished getting a bachelor's degree and on my way to earning a master's degree. Without her support, I would not be in the program. Thank You.

Acknowledgments

I would like to give a special thank you to the many people in my life that have helped me become the VFX person that I am today:

To Southeast Guilford High school and Robert Tidwell- Thank you for offering scientific visualization classes that sparked my interests in visual effects. Thank you to Mr. Tidwell for teaching 3DS Max to students and making them interested in game design, 3D work, and visual effects. While I was in your class in high school, your teachings influenced a lot of people to pursue the world of CGI and the opportunities opened up. Without these classes, I would not have started this journey and would not be in this MFA program at all.

To the University of North Carolina at Wilmington - Thank you for having Digital Arts as a minor. I did not know arriving at UNCW how to mesh together my interest in 3D and Film Studies, but the minor was a good blend between the two. The Film Studies program has taught me the importance of knowing historical events that influenced the design of a film and also the technical side of cinematography and production.

To my Fellow Grad students in DPA: Thank you for assisting me in the completion of my thesis. There is an abundance of talent and it was an honor working with all of you in a specific part of the pipeline.

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Chapter 1

Artist's Statement

Growing up I have always been fascinated by monsters and how they were represented in cinema. From giant dinosaurs in Jurassic Park (1993) to Kaijus in the movie Paciic Rim (2013), these creatures have always expressed our civilization's fears, and it is interesting how artists could represent these in different medias. Computer Generated Effects have advanced our imagery of monsters in entertainment, and with the increase in technology, also increased the likelihood the audience would believe the monsters. My approach in making realistic monsters is to apply trops used in past movies and integrate them with computer generated effects so that it looks like the monsters are interacting with the real world. My main focus will be using artistic inspirations from *The Three Amigos*, Alfonso Cuarn, Alejandro Gonzlez Irritu and Guillermo del Toro because of their character designs and cinematography to create the fearful monsters in their films. These three directors integrated societies' fears and reconstructed them to form terrifying monsters. I will also incorporate the artistic styles of the Gothic German Expressionism era to design some of my environment pieces. The artistic era that influenced the classical horror monsters did so with their peculiar set designs of harsh and jagged buildings and with the use of contrasting lights which I integrate as well.

Chapter 2

The Fascination Of The Strange

2.1   From Past to Present

Beasts, creatures, fiends, monstrosities are all terms used throughout history to convey the imagery of a monster. Civilizations from different eras of time have some form of monsters in their cultures, and those legends and myths continue into modern society. Why have monsters became so popular in today's society? Myths and stories that contained monsters are often offering an answer that science and reasoning cannot answer and may people accept that. The stories are also very captivating, and they are always remembered when being retold in the form of literature, movies, and even bedtime stories told to children [62]. With monsters being so abundant in civilizations, people always wonder where did they originate? Monsters accumulate over centuries of newly discovered fears that society could not address and fathom. The mind works in a fascinating way when it comes to interpreting what the eyes see. The brain might make people see giant humanoids out of everyday apes, or a aquatic serpent out of a piece of drift wood. Imagine a time without the advancement of technology and reasoning, where a peasant farmer happens to unearth a dinosaur fossil. A fossil from a dinosaur, especially the skull, can be astounding and raise confusion for someone that does not know what it is. Early civilization discovered dinosaur fossils like the ones in below, and would assemble them together with other gargantuan fossils and create monster skeletons. Since technology was lacking in carbon dating and genetic matching, some of the early paleontologists would start combining different dinosaur fossils with each other. The results would end up creating the myth of dragon-like monsters that spanned over different cultures and incorporated in their stories as well

[81].

Figure 2.1: Fossils from Bob Campbell Geology Museum

Figure 2.2: Fossils from Bob Campbell Geology Museum

Figure 2.3: Fossils from Bob Campbell Geology Museum

Figure 2.4: Fossils from Bob Campbell Geology Museum

Fear is directed toward an object or situation that does not present a real danger. The way the human brain works in rationalizing what an individual is inexperienced with is the reason why modern society has monsters in entertainment [44].

2.1.1 Greek and Roman: The start of a myth.

Ancient Greece, a civilization known for its advanced warfare and powerful reign from 750 BC - 480BC, ruled most of the Archaic Age. With their dominance and power, the empire also had an emphasis on literature and arts. Their society had a collection of poets and writers that would tell amazing stories that would inspire and influence the people of Greece into believing gods. One of the more popular poems is called the *Illiad* by the poet Homer. This epic poem describes the adventures of Achilles, a Greek hero that fought against the Trojans, and his struggles with war and his interactions with other Greek gods [73]. Following the fall of Ancient Greece's empire, the Roman empire rose and took their place in the world. Just like the Ancient Greece empire, the

Roman Empire also had a powerful and destructive army that helped their civilization take over. With their rise in power, they also had their own set of myths and legendary literature [47]. What made these two civilizations so dynamic and overpowering that they could take over? The stories of great gods and goddesses that captivated their culture ended up leading them to be a society that were cautious of their actions because it would have upset their deities. Since gods were depicted mostly as humans, it can be difficult to relate them as early monsters. Gods and goddesses fit the many aspects that categorize a monster. Though portrayed in a humanly form the gods are often painted in artwork as being superior than an everyday civilian. The *Chamber of Giants* an architectural building dated in the Late Renaissance, is structurally built to convey the figures in *The Fall of Giants* as higher beings. Painted on the ceiling of the building adds values that they are towering over people, and most gods during this time are depicted sitting on top of clouds, which adds to the monstrosity effect [70].

Figure 2.5: Fall of the Giants by Giulio Romano [70]

Why are gods being painted to such a high standard? The adventures of these great beings are always passed on with the common theme that the antagonist is a ferocious monster. In general, most of these stories relate to the trope that it takes a monster to destroy a monster. Consider the

myth of Hercules, the son of Zeus, a demi-god that was famous for his inhumane strength and his far ranging adventures. Since Hercules was such a famous warrior, the king of Tiryns sent him on a journey to complete 12 tasks. This resulted in the story of the twelve labors of Hercules, that depending on what poet retold it, had him battling magnificent monsters. A tale so popular that Hercules was detailed in some discovered artifacts like the ones below. Some of these monsters included a Hydra that would regrow its head every time it got cut off, Stymphalian Birds that had claws and beaks as sharp as metal, and a Namean Lion whose pelt is so durable no weapon could pierce it. These twelve tasks not only set the idea that Hercules was not a normal civilian, but there were monsters in this world that would bring fear into anyone who had the opportunity to hear the stories. [50]

Figure 2.6: Hercules Lion Vase 1

Figure 2.7: Hercules Lion Vase 2

Figure 2.8: Hercules Lion Vase 3

How did these animals get characterized as such beast? Fear is the main component in creating such creatures for Hercules to fight against. The battle with the Namean lion is a fascinating story of a lion that was larger than man, with an impenetrable hide that weapons bounced off of. A monster of that magnitude could not have existed in the past. The last animal that was close to this description was the Eurasian cave lion that lived around 11,000 BC. Though not alive during the time that the tale of Hercules was being told, the lion was alive and lived near a civilization that captured its ferociousness through stories that got passed down throughout generations. Based off the fossils found of the common cave lion, the Eurasian Lion would have been 25 percent bigger

than a modern lion, making it a monstrous size compared to modern man. Since this creature was living near early population, a lot of the stories resulted in the sounds and activities that people hear at night. With the lack of light, the villagers envisioned a giant creature killing people only to hear their screams of help fading away as their bodies were being carried away. A lion capable of carrying a grown villager away supported the idea that the Namean Lion was larger than the average man and since the descendants of the Eurasian Cave lion hunted at night, the sound of a lion's attack would have given anyone a fearful imagination. In a dense jungle, vegetation would have blocked and impaired anyone's vision and the only thing to get a sense of size would be glimpses of movement. This definitely attributed to outrageous size of the Namean Lion. Another great feat of this monster was that its hide was impenetrable and every warrior that went to kill it failed. Only Hercules, with the strength of a demi-god was able to choke it to death and skin it so that he may wear it for protection.

This can seem implausible in modern day, but this story was created when weaponry was not of the highest quality. Most of the people that lived there, would hunt using a rough bow and arrow. Even with a durable metal, without it being sharp, a shot on a lion would just bounce off. Evolution also played a role in the invulnerable hide. Since cave lions tend to live near mountains back then, their hides and body had to adjust to the colder climate. Thicker skin and more muscles kept their bodies from freezing. Seeing all of these events created a never ending retelling that would get skewed by each iteration that passed to the next person, resulting in the myth of the Namean Lion [50]. The Namean Lion was a such predominate beast that it is referenced in Disney's *Hercules* (Figure 2.9) and the live action rendition *Hercules* (Figure 2.10).

Figure 2.9: Hercules vs Namean Lion in Disney's Hercules [10]

Figure 2.10: Hercules vs Namean Lion in the 2014 film Hercules [22]

The Iliad, an epic poem that was originated in Ancient Greece, tells the tale of the great Trojan War and the events that lead to it. Accredited to the great poet Homer, this poem also included monsters that struck fear in people's mind. These ranged to the Calydonian boar that is owned by Artemis to Chimeras, which are considered the most terrifying creatures in Greek mythology. Interestingly, the story of the Calydonian boar sets a preface to the story of *The Iliad*. According to Greek Mythology, King Oeneus of Calydon refused to make a sacrifice to the goddess Artemis, which resulted in her sending a wild boar to ravage the country. This boar was always described as having shiny teeth, which likely were a boar's tusks. Imagery also plays a role with the myth of the size of this beast. In some Greek ceramics, there are detailed graphics of a battle between people and this boar. The boar is depicted as being the length of two people, also as tall as an average human, again most likely an exaggeration. What accounted to the spectacle of the giant boar is surprisingly the lack of educated people that found fossils of other animals. Elephants for example, were around during the time that the Greek empire was alive and their skeletons are massive compared to a boar. The story of the Calydonian Boar hunt inspired many upcoming hunters to test their strength and willpower. This lead to people tracking and hunting boars, which can be seen in their recovered artwork. One aspect of boar hunting is traversing the boar's living grounds, and they would discover elephant tusks instead. This lead to an imagination that created the giant, terrifying Calydonian boar [50].

Figure 2.11: Hercules vs Boar in Disney's Hercules [10]

Figure 2.12: Hercules vs Boar in the 2014 film Hercules [22]

One integral part of mythological stories are monsters that are imagined as hybrids of two or more different animals. A fear of early civilization is seeing something so abnormal that science could not explain it. Some examples found in the Greek myths are the Minotaur(which is half man

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half bull), the Centaur (which is half man half horse), and the chimera (a mix of a lion, goat, and snake) [63]. The Chimera is an interesting monster compared to the other ones that are a hybrid with man. Described as "a thing of immortal make, not human, lion-fronted and snake behind, a goat in the middle, and snorting out the breath of the terrible flame of bright fire." by Homer, this monster was idealized as the most atrocious monster in myths [48]. It was so memorable that other cultures had its own variations of a chimera. It was originally depicted with a base and head of a lion, goat head attached to its back, and a tail of a snake. Other cultures took this idea and veered off of it to have other creations like a lion with wings, or a human face with a scaly body. Though the Chimera would be the most exaggerated of all mythological monsters, its significant to Greek Culture and other cultures raised a question of why it was so predominant in history. Some representations of Chimeras can be found below.

Figure 2.13: Base Representation of a Chimera [76]

Figure 2.14: Persian or Indian Representation of a Chimera [40]

Figure 2.15: Chimera Representation on the Vase of Darius [40]

Figure 2.16: Chimera Representation at the Louvre Museum [40]

Some speculate how the imagery of the Chimera became such a creation. An animal that was a combination of three different species could not have existed, but it was depicted in past artwork

and literature all the time. One suggestion is that early human civilization fossil discovery attributed to the Chimera. There are instances in Paleontology where paleontologists uncovered a combination of animal fossils together because they were covered in tar or flash floods. Since civilizations were not knowledgeable about fossils in the past, early man possibly confused the skeletons of a lion, goat, and snake on top of each other and formed the body of this mythical beast [82]. The origin of this myth could also be traced back to a place called Mount Chimera. Located in ancient Lycia, this area was notable because it would randomly burst in flames. Surprisingly, what contributes to the ongoing flames is the endless supply of methane in the mountain. The imagery of a land engulfed in flames would be terrifying to anyone hearing about it, which attributed to the birth place of the Chimera. Some people can visit Mount Chimera and see the fire that contributed to the vision of [82]

Figure 2.17: Drone picture of the Flames of Mount Chimera, Lycia [82]

Some stories consider the Chimera being spawned from this land, where others considered that it was its protector. There is a common theme that would result in these stories that is in the *Iliad*. Homer described the the beast as having a goat head that breathed fire. Scientist has studied Mount Chimera has active methane pockets that would keep the land ignited and stayed lit for as long as 2500 years. This resulted in some historians believing this is why the land is attributed to the birth of the myth of the Chimera [34]. Since the imagination of early civilization was to exaggerate

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animals that a few were able to have the opportunity to see, the animal monster idea became to fade over time. More exposure studying these animals would reveal and that they are just animals and not monsters at all. It was just the imagery from past records that depicted such ferocious beings. With the development of more advanced cultures and societies, so did the fascination to explore, which resulted in a new set of fears and types of monsters.

2.1.2 Thalassophobia

The idea of travelling across water to other lands, whether it was for trading, exploration or even warfare has always been a part of history. There are examples of this from early sail boats recovered over the centuries. With such a vast ocean to traverse, most early sailors had to spend an extensive amount of time on the open waters. Whether it was man-powered rowers or relying on the winds to carry voyagers through treacherous waves, most of these trips can last anywhere from weeks to months at a time [33]. With the emergence of a new transportation at the will of a civilization to experience, there was an uprising in the occurrence of Thalassophobia. Originated from the Greek, thalassophobia is an abnormal fear of the sea or how empty the sea is. This psychological fear tormented many sailors throughout history, enough so that their imagination stirred up some unimaginable monsters. Some of modern society's more popular aquatic monsters, like Mermaids, Krakens, and Kaijus, can be traced back to the monsters that were conceptualized while being on the ocean. Some variations of mermaids can be seen in Figure 2.18, while Figure 2.19 is the imagery that most sailors fear when there is any mention of Krakens.

Figure 2.18: Depictions of Mermaids in
old folklore [49]
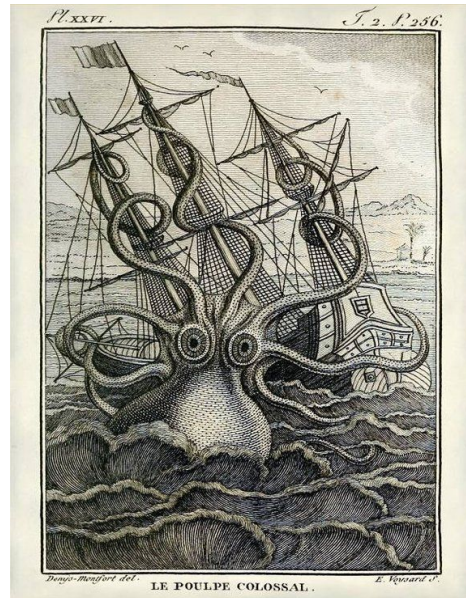
Figure 2.19: Depiction of a Kraken[74]

Why are these monsters fabricated through out history and integrated into modern culture?
One reason can be contributed to the early times of sailing and how one's health could modify one's
imagination of what they see. Scurvy, a disease that caused pain and fatigue because of a lack of
vitamin C, was predominant risk that was lingering between the times of Columbus' voyage and the
use of steam engines. Since the length of time voyagers were out on the ocean was unpredictable,
many adventurers were depleting their resources and becoming malnourished [69]. Some symptoms
that occur are fatigue, and hallucinations and that lead to many stories that created these fascinating
creatures. Many tales and stories traveled among historical sailors, but one of the most common
were the sightings of the mythical mermaid. A creature mostly depicted with the torso of a human
maiden and the bottom half of a fishes tail, this monster has been the antagonist of many myths
and stories that resulted in demolished ships. Such an intriguing monster that some considered a
variation of the chimera was so distinguishable that it kept its imaginative form through different
cultures and had little to no variation. A legend so popular that many artists have incorporated
it into their art pieces. Jean de'Arres depicts a mermaid transforming after taking a bath in his
artwork *Le Roman de Melusine* (Figure 2.20). The initial form is unchanged and has some common
aesthetics with the descriptions form sailors. These recurring themes can be seen in the Copenhagen
Mermaid Statue (Figure 2.21) and drawings from 1275 (Figure 2.22).

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Figure 2.20: Le Roman de Melusine by Jean de'Arres 1450-1500

Figure 2.21: Copenhagen's Mermaid Statue [49]

Figure 2.22: Mermaid depiction from 1275 - 1325 [49]

Greek mythology also includes of Sirens, which were a slight variation of a mermaid, that would lure men to their doom by using their enchanting voices to cause vessels to become shipwrecked. There are many phenomenons that could be a factor to why sailors would see these monsters on the open waters. Just like past myths of monsters, science and archaeology could be considered a factor to the myth of mermaids. In the science world, there is a modern birth defect that occurs every 1 in 60,000 to 100,000 births [65]. It is called Sirenomelia, which some would call the mermaid syndrome. The defect that is common among Sirenomelia is the fusion of the lower extremities, which would result in the appearance of a mermaid according to Greek culture. Since the birth defects occurs at one percent chance there are possibilities that some fossils were discovered with fused limbs and convinced some people that mermaids existed in the past[45]. Below is a picture of a skeleton with Sirenomelia (Figure 2.23). Notice how one leg never fully developed, resulting in the appearance of having a tail.

Figure 2.23: Skeleton of an individual with Sirenomelia [45]

Another possibility could be that exhausted sailors that had been sailing over an extended amount of time had their imagination get the better of them. Since the ocean is filled with animals with vast variations of sizes and appendages, perhaps some work mistaken by early sailors as a mermaid. The Sirenia, commonly known as a sea-cow, manatee, and dugong, could have mislead many voyagers into thinking they had seen a mermaid out in the ocean. With such a lethargic, sluggish moving creature in the ocean, it raises questions how this can be mistaken as the angelic mermaid known throughout history. Some scientists can attribute the mixture of exhaustion and the refraction of water as a contributor of the mix up. This was so common that historians have recalled Christopher Columbus thought he saw one during his voyage to the New World [41]. In one of his journals, he recounts the tale of seeing three mermaids at sea. Christopher Columbus even stated that the manatees were "not half as beautiful as they are painted.", which many historians believed was because he witnessed the first encounter of manatees that were ever documented [39]. The underside of a Beluga whale has a predominant pelvis bone that can be mistaken as legs fused into a tail (Figure 2.24). While the Dugong looks more like a torpedo, its slender figure could be mistaken as a body (Figure 2.25).
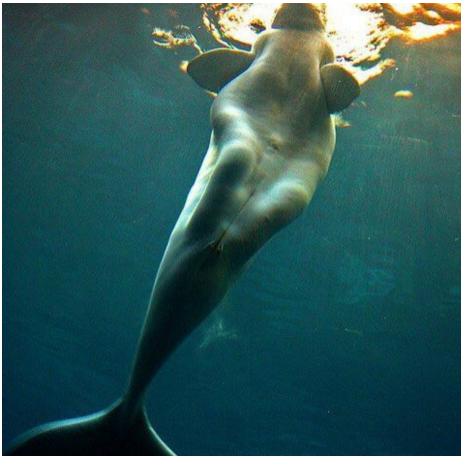
Figure 2.24: Bottom view of a Beluga Whale, commonly mistaken as legs. [41]

Figure 2.25: A Dugong in water. [41]

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Thalassophobia does not solely include mythical monsters like the mermaid. Many lore and folktales include gigantic monsters that encapsulated fear among the sailors. The story of the Kraken, a giant squid or octopus known for demolishing ships and vessels, is a particular such story. Something so enormous living in the ocean has had some support. There have been recounts of ginormous carcasses that washed up on shore, which scientists say belong to the cephalapod family [74]. Scientists have also discovered bite marks on sperm whales, one of the largest sea creatures alive today [71]. The thought of a myth being real enhanced the societies fear of the open ocean, but it also developed the imagery of a sea creature or sea monster and allowed the depiction of a monster be more believable to the world. Artists now can integrate descriptions based on the past and have a baseline for the monster's features that would be influenced by realistic standards of ginormous creatures[74]. Below is a comparison from a Japanese research boat pulling in a Giant Squid (Figure 2.26) and an artist depiction of a giant kracken (Figure 2.27).
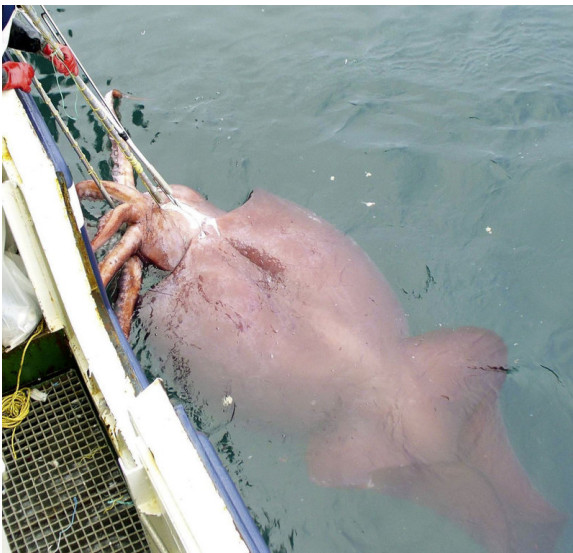
Figure 2.26: Real life Giant Squid [74]
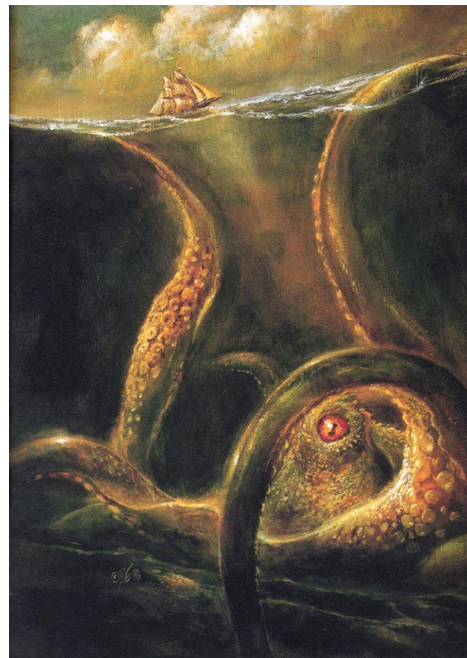
Figure 2.27: Kraken art depiction [74]

2.1.3 The Rise Of "Freak Shows" And People As An Attraction

The fascination of the abnormal or strange has been a part of civilization for ages. Different cultures have heard of the myths growing up and knew of their own monsters but did not see people

as monsters. A lot of cultures around the world transformed the thought of a monster to not just a different creature, but to anybody with a peculiarity that distinguished them from the typical. This curiosity or fascination with these people lead to a rise in entertainment across the globe. By the 16th century, the phenomenon of the circus began to overtake Europe. There were business men that would take people with abnormalities and showcase them around the countries of Europe; by combining their genetic mutations with captivating storytelling, the circus created a re-telling of monsters. One of these pioneers of showmanship was Phineas Taylor Barnum, also known as P.T Barnum. P.T Barnum was a business man that used human psychological interests in monsters and used that to changed the idea of fears and curiosity so that monsters are more anthropomorphic [43]. He has had many acts ranging from conjoined twins to the oldest living woman. P.T Barnum created a spectacle that intrigued everyone and lead him to create the greatest show on earth, the Circus. Developing the circus allowed people from all over to witness these "monsters" and start imagining some of their own. Such influences created such creatures like Dumbo (1941), an elephant with exaggerated ears giving it the ability to fly. Watching this cartoon and seeing the circus abnormalities actually influenced some of the Gothic horror monsters that are known and popularized today [58].

2.1.4 The Art Movement That Changed The Idea Of Monsters

Monsters have always been imagined through stories that integrated with the world in a way that struck fear upon civilizations. The imagery used to depict these creations typically have animalistic tendencies and characteristics, stemming from folklore that has been passed down over generations. While circuses were materializing across Europe, a new movement also arose to contribute to how people perceived monsters. Germany as an art culture was at the dawn of their creative spark. Being oppressed by the German government, German artists generated a new art form that spread across the world and still inspires some artists today. German Expressionism is an artistic genre that originated in Europe in the 1920s and is broadly defined as the rejection of Western conventions. It is a depiction of reality that is widely distorted for emotional effect. All artworks in this movement were inspired by artists like Vincent Van Gogh, Edward Munch, and El Greco; so they all share some similar qualities. German Expressionists were innovative because they did not produce aesthetically pleasing compositions; instead artists were focused on creating powerful reactions to their work through the use of bright, clashing colors, flat shapes,

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Figure 2.28: Hugh Jackman as P.T Barnum in the Greatest Showman [30]

Figure 2.29: P.T Barnum with Tom Thumb [43]

and jagged brushstrokes. In its nature, the movement was interested in the relationship between art and society, and encompassed a broad range of fields, including architecture, painting, and film [38]. Below are examples of how artists George Alexander Mathey and Frans Masereel incorporated German Expressionism in their art pieces. Utilizing broad strokes, jagged angles, and contrast, they created unique pieces that would be a part of this movement.

Figure 2.30: Anbetung by Georg Alexander Mathey [59]

Figure 2.31: Businessman by Frans Masereel [1]

In the cinematic world, two filmmakers used aesthetics of German Expresisonism and created movies that influenced the modern day monster. Fritz Lang and Robert Wiene were two directors that produced prominent pieces of German cinema, *Metropolis* and *The Cabinet of Dr. Caligari*. Robert Wiene hired Expressionist painters to make the set for The Cabinet of Dr. Caligari. Tasked with the job to challenge Modernism's formal and stylistic elements, the painters Walter Reimann and Harmann Warm used Expressionistic techniques to experiment with perception. Combining both jagged lines and incongruous patterns, they constructed a nightmarish world for Dr.Caligari's monster to live in. The setting itself created a disconnect between subjectivity and reality by having sidewalks lead nowhere, walls appearing as warped borders, filling the background with strange shapes, and having buildings rise at distorted angles. Having the background painted, instead of constructed gave the film an unnatural feel. On top of that, Robert Wiene chose to paint on the shadows as well instead of creating it with lights. This allowed the unnatural shadows to drape across the screen and engulf the characters. Since the sense of anxiety, distrust, and uneasiness were at an apex in Germany following World War 1, Robert Weine demonstrated the use of having art

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imitate life, which established the frightening narrative of a monster in its natural habitat. [38]

Figure 2.32: An unnatural scene in The Cabinet of Dr. Caligari. [20]

Figure 2.33: High contrasts in Metropolis. [3]

Since monsters were generally depicted in horror movies, German cinema accentuated this trope with use of Chiarscuro. Not only were the painters involved with transitioning the ideology of monsters relating to humans, but the lighting is a key factor in the modern look of monsters. Throughout the German Expressionist era, the use of Chiaroscuro rendered out the fear that was associated with monsters. This style of lighting was established by generating extreme high and low tones on camera to construct harsh shadows. Having harsh shadows and high contrast sets allowed film makers to conceal monsters in the darkness, which fabricated the elusiveness even more, heightening the fear in monsters (Figure 2.34). Having high contrast allowed viewers to see distinct silhouettes of the monster, which elongated some features even more. Nosferatu's Count Orlock has exaggerated fingers, but when the monster's shadow is projected on a background its fingers are even more exaggerated (Figure 2.35). This artistic technique not only advanced the horror imagery in a monster, but it also created a connection that these monsters are just overemphasized people [36]. Chiaroscuro was not exclusively established through lighting, but also the use of make up and costumes. Most German Expressionist films illustrated the nightmarish aspects of monsters by highlighting details to make them stand out compared to the classical Hollywood character. A German expressionist film character usually has their eyes and lips outlined with black while the rest of their face was pale. This created a high contrast on their face that pulls the viewer's attention to the uneasy feeling that is popular with the expressionism. Costume design in these films accentuated the overall figure of each character compared to their background. Cesare (The Cabinet of Dr. Caligari) was a slimmer monster and he mimicked the sharp and acute angles of the

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painted scenery. Count Orlock (Nosferatu) was the opposite and had a bulkier build which created more of a contrast between him and the setting. These techniques and the German Expressionist movement established a standard for the representation of monsters in cinema and some aspects even influenced recent directors like Tim Burton and Guillermo del Toro, where viewers can see similarities between this art style and their films (Figure 2.36). [67]

Figure 2.34: Screen Grab from The Cabinet of Dr. Caligari. [20]

Figure 2.35: Count Orlock's shadow caused by lighting. [2]

Figure 2.36: Chiascuro from Edward Scissorhands [7]

2.2   Leo Braudy's fears

Monsters have been incorporated in society, spanning over different cultures and decades. They are each influenced by unique designs that are integrated into individual civilizations. They can range from having massive proportions or having augmented abilities to being antagonists to humans. Despite all these drastic variations, they all had a recurring theme: Fear. These monsters tapped into the psychological fear that is in all of civilization. Professor Leo Braudy, from the University

of Southern California, characterized that all monsters in history can be connected to fear. In his book *Haunted: On Ghosts, Witches, Vampires, Zombies, and Other Monsters of the Natural and Supernatural Worlds*, Braudy divides monsters into four categories for these associations. [35]

There is the fear of the natural world in which civilization embodies the fear of an uncontrollable nature that surrounds society. Within this aspect of fear the monsters are placed in two categories: the timid or the menacing. The shy or bashful monsters throughout history are the ones that stray away from human civilization. They are are the ones that avoid interacting with society and are usually discovered when someone is in the wild. Some examples of these type of monsters would be the legends of Bigfoot and the Lochness Monster. These monsters are inspired by fossil discoveries where some believed that similar creatures are still alive today. With few sightings and only a collection of bizarre footprints and hair samples, some theorized that Bigfoot is a Gigantopithecus that survived for many years [46]. The idea of having a prehistoric creature living in the modern era evokes a primal fear because it is an unknown creature that can not be studied clearly. The menacing part of the natural monsters are the ones that are exaggerated to cause destruction against civilization. These monsters personify the fear that nature will one day take revenge on society for harming the natural world. Some examples of these monsters are the gigantic monstrosities King Kong and Godzilla. The legend of Godzilla, created by Tomoyuki Tanaka, Ishir Honda, and Eiji Tsubaraya, is considered as the long reigning king of the kaiju monster movies. Since the bombings of Hiroshima and Nagasaki, the Japanese people considered Godzilla as a way to express their fear of radiation and the long-term effects of the nuclear weapon testing. Godzilla was a symbol of the death and destruction caused by radiation and the legendary monster is an iconic representation of the fear civilization has with nature [55] [35]. Like Godzilla (Figure 2.37), other movies incorporate the fear of the natural world. King Kong (Figure 2.38), Jurassic World (Figure 2.93), and Pacific Rim (Figure 2.40) have utilized the trope of gigantic monsters that wanted to harm humans.
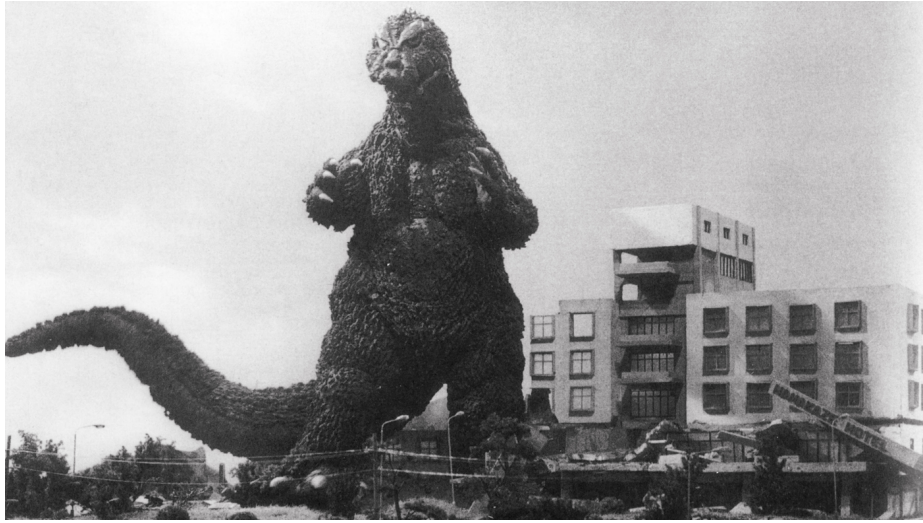
Figure 2.37: Fear of the Natural World: Godzilla made by Radiation. [77]

Figure 2.38: Fear of the Natural World: King Kong: a titan of an ape. [14]

Figure 2.39: Fear of the Natural World: Prehistoric Monsters Living in Modern Times. [23]

Figure 2.40: Fear of the Natural World: Kaiju coming from the depths of the Ocean [25]

The second category of monsters would be a part of the fear of science. Leo Braudy described this fear as a relationship of trying to mimic creationism and the consequences that followed. In the late 1800s there was a rise in technology in the scientific field, resulting in many scientists testing their hypothesis in trying to resurrect the deceased. Mary Shelly took these stories and developed one of the most iconic stories associated with monsters ever: Frankenstein. A novel about Victor Frankenstein, a scientist that successfully reanimates a corpse which leads to destruction and the end of Victor's life. This fear that civilization can create its own demise lead to many Hollywood monsters. The classical Frankenstein's monster (Figure 2.41), Robocop (Figure 2.42), and Alita (*Alita: Battle Angel*) (Figure 2.43) are all part of the scientific idea of galvanism that started in the 1800s.

Figure 2.41: Frankenstein is made up of different bod parts and electricity.

Figure 2.42: Both Robocop movies entail of the main character being brought back to life with robotic parts.

Figure 2.43: Alita, a robotic beings made to be as human as possible.

Another phenomenon that has risen over the years is using science to study and understand animals. Animals have been used in experiments for decades, and though it has helped in scientific researched, it also sparked a fear that the animals will be more advanced than the human population. This idea developed into into classical movie series called *Planet of the Apes*. The premise of this series is that apes have evolved over time to learn how to speak and the human race slowly degraded to that of cavemen. This differs from the fear of nature, because science was involved in making the apes more intelligent, while a virus was spread among people that slowly wiped out the human race [35]. Though the older series revolved around the future and time travel, it is revealed that a virus is the cause of intellectual primates. A remake by Tim Burton was made in 2001, which emphasize that intelligent apes stem from the first ape astronaut (Figure 2.44).The recent Planet of the Apes movies prefaces the events of the older series, but focuses more on the background of the virus and how the a science has created intelligent apes as seen in Figure 2.45.

Figure 2.44: A chimpanzee trained to operate a rocket in Planet of The Apes (2001) [11]

Figure 2.45: Koba being studied by the scientist at Gen-Sys (Rise of the Planet of the Apes)[19]

The third category of fear is the fear of one's self. This fear is more related to human psychology in which a person is involved with a doppelganger, lives two lives, or even has multiple personalities. This does not only include movie monsters that are evil twins of the protagonist, but in terms of fears of the monstrosities of ones otherwise repressed self. This psychological phenomenon was influenced by Sigmund Freuds early development of his theories of psychology and the inner self. The most classical monster to come from this fear is the Jekyll and Hyde monster. The story of the *Strange case of Dr. Jekyll and Mr. Hyde*, written by Robert Louis Stevenson, is an investigation of the murderer Mr. Hyde which leads the police to Dr. Jekyll, only to find out that they are both the same person (Figure 2.48). This concept of the duplicity of human nature molded the imagery of all kinds of modern day monsters. Marvel's the Hulk (Figure 2.46) can follow this same kind of concept of the fear of one's self. Two personalities that try to take over and control one body. M. Night Shyamalan's movie *Split* also involves a protagonist that battles with oneself over the multiple personalities (Figure 2.47). [35]

Figure 2.46: A cover of *The Incredible Hulk* [56]

Figure 2.47: Split Personality shown through the movie Split [28]

Figure 2.48: A shot of the two personalities in Dr. Jekyll and Mr. Hyde (1941) [5]

The last category of monsters is the ones that belongs with the fear of the past. There are monsters that arrive from the past and take revenge on society and the transition into a progress, improvement and change. The most prominent monsters that are still influencing entertainment now are Dracula and the vampires. According to Braudy, many Christians perceive Dracula to be a monster from the past that influences their moral agendas. For example, Dracula tempted people to have lust for evil. Dracula is such an iconic monster that there were multitudes of variations when Hollywood started to adapt it into cinema. The two most notable ones are Nosferatu and Bela Lugosi's Dracula (Figure 2.49).

In the stories of Dracula, Van Helsing also integrated objects from churches to take down Dracula. It is interesting Professor Leo Braudy could categorize all monsters to this, but what makes this even more fascinating is that these four categories relate to monsters past and present. Even ones that have been created in the last few years can be linked to one of these four fears. [35]

Figure 2.49: Both Nosferatu and Dracula have religious influences that are brought back to tempt Christianity. [54]

Chapter 3

Representation of Monsters in Movies.

3.1 Rear Screen Projection

Film monsters are visuals that encapsulate the audience's attention because they are things the audience is not accustomed to seeing. These unique creatures on screen express the fears that Leo Braudy discusses. Having monsters combined with great storytelling can immerse any audience member into these themes. There were numerous different ways to accomplish the feat of having a monster on camera, but one major technique that sparked the advancement of monsters is the use of Rear Screen Projection. Rear Screen Projection is the method used to capture foreground performances with pre-filmed back grounds. This film technique was used in many films since its development. The most significant monster movie to be impacted by rear screen projection was *King Kong* directed by Merian C. Cooper and Ernest B. Schoedsack in 1933. King Kong is a tale of an enormous monster that kidnaps a heroine and causes havoc across New York. Having such a gigantic gorilla on the same screen with actress Fay Wray would be hard to film so this is where Rear Screen Projection comes into play.

Directors Merian C. Cooper and Ernest B. Schoedsack hired Willis O'Brien, a cinematographer specializing in stop motion, to handle the task of getting a behemoth monster on screen. The first step in accomplishing the feat was filming the 18 inch pose-able monster animated in stop

motion on a miniature set. A projector is then placed behind a translucent screen and emits the shot footage. The projected footage being on a screen ends up being scaled much bigger than normal, which results in the ginormous monster (Figure 3.3). The directors then placed actors in front of the translucent screen and films the actions of each shot. This allows the actors to react in real time to these monsters, as well as have the actors on proportionate set pieces like a giant tree. This technique allows the actors to express real emotion because they can see what is supposed to be interacting with them. Willis O'Brien and his team took this one step farther and incorporated a bouncing technique with their projection. In some shots, the directors needed the talent to walk behind the screen. The problem of this is that the actor would cast a shadow on the screen, so to solve this they incorporated a mirror. They would place the projector off to the side and reflect it onto the screen. This allowed objects to pass through the projection scene and seem like they are behind it, and interact by having the object move to the foreground (Figure 3.4).
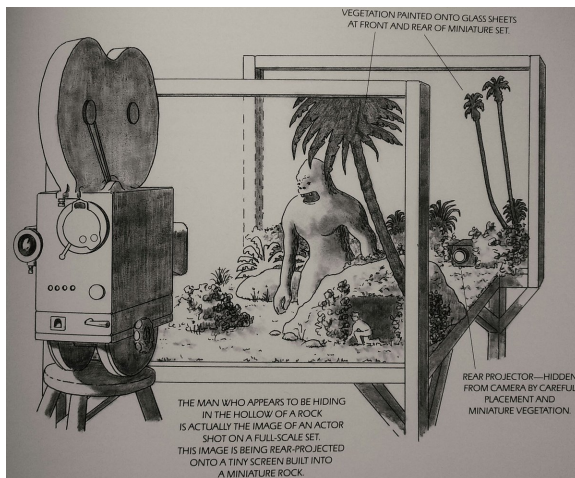
Figure 3.1: Diagram showing how Miniature Rear Projection Works. The small space in the bottom right allowed projections of a live action sequence in animation space. [31]
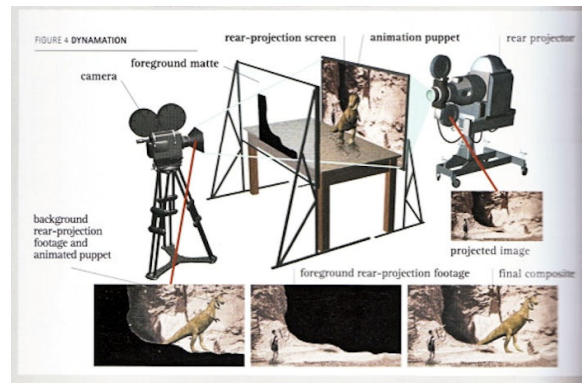
Figure 3.2: Diagram showing how Miniature Rear Projection Works. The small space in the bottom left allowed projections of a live action sequence in animation space. [31]

Figure 3.4: Diagram showing how Rear Projection works so that something can walk through the projection. [31]

Figure 3.3: Diagram Basic Rear Projection. [31]

Kong also incorporated the innovative method of miniature projection. Miniature projection opposed the Rear Screen Projection technique by filming the foreground elements, like the actors first (Figure 3.5). The stop motion animators would then make their scaled stop-motion set and incorporate a screen into it. The projector would then have a small area to project to and display the actors in the stop motion (Figure 3.2). This technique allowed for the actors to be placed in a small environment within the stop motion scene like a cave or hole. One memorable scene in King Kong, the male lead Bruce Cabot hides in a cave just below the top of a cliff. The King Kong stop motion model reaches over the edge of the cliff to grope for Cabot in the cave. The actor was actually filmed earlier in a full sized cave set, then projected from the rear onto a small screen just beyond the mouth of the cave on the miniature set. As the modelers photographed each frame of King Kong's actions they moved the film of Cabot ahead one frame also, giving the illusion of a small man hiding from an enormous ape. Using these methods help create the grand illusion on screen that a miniature puppet could be some giant animal terrorizing normal size people and made the film King Kong such a massive success in 1933 (Figure 3.1). [52]

33

Figure 3.5: Miniature Puppet of King Kong in the 1933 film. [31]

3.2   Practical Effects: The use of Makeup and Cinematography

The early age of monster movies were lacking a tremendous amount of technological advancements. In King Kong, the directors had to rely on stop motion animation combined with camera tricks. A multitude of movies had to reflect on the approach to create a monstrosity in their movies that would be encapsulating to the audience. To capture the gigantic essence of Godzilla, there was a suit that someone had to wear when they filmed the city destruction scenes. Haruo Nakajima, the original suit actor, had to destroy a constructed miniature city that created the illusion of a giant tormenting a town [77].

Figure 3.6: Haruo Nakajima in the Godzilla suit with a scaled set behind him. [77]

A lot of modern directors still use practical FX artist to create main monsters. Guillermo del Toro hired special FX makeup artist, Steve Wang to create his movie character Abe Sapian. Abe Sapian is a marine humanoid that has fish-like features integrated into a person. Using practical FX like makeup and masks allowed the actor, Doug Jones, to express and improvise making a believable alien-like performance.

Figure 3.7: Comic book version of Abe Sapien. [60]

Figure 3.8: Steve Wang and Guillermo Del Toro with the practical make up for Abe Sapien. [13]

Figure 3.9: Doug Jones as Abe Sapien in the movie Hellboy. [13]

Classical movies had to incorporate a lot of make-up, costumes, and masks to portray the gruesome aesthetics of monsters. The Planet of the Apes saga from 1968 had to incorporate the use of latex masks on their actors to look like actual evolved apes. Incorporating the use of make-up adds another factor of realism and credibility to a film by allowing actors to interact with each other. The masks were made of several pieces that would be seamlessly combined to make the ape like in (Figure 3.10) [54].

Figure 3.10: Make up process actors had to sit through to look like an ape. [54]

Film makers have the opportunity to capture believable emotional responses because actors are able to see and interact with these monsters. This was used in films like Jurassic Park, where the use of mechanical puppets designed to appear as dinosaurs allowed the realistic expressions of fear and wonder brought on by the beasts. Rick Baker, a makeup artist known for *An American Werewolf in London*, once said "There is a magic that happens when you have a really great actor in great make-up. He is there on the set; he can improvise and do things. If he is on a motion capture stage with a bunch of markers on his face, even great actors have a hard time in an empty room." If done right, the ability to interact with monsters adds a sense on authenticity to a film [75] [57]. Another method is combining the use of practical FX with in-camera effects. Cinematography have a psychological effect that can influence viewers into believing the aspects of a monster. Cinematographers have used these techniques as an art form to convey and exaggerate certain features of a creature. In Jurassic Park, Steven Spielberg used a super low angle shot to show the gigantic size of a brontosaurus grazing on top of some tree tops. A low angle shot make the subject of the

frame look stronger and more powerful. For framing, he placed the actors on the lower half of the frame and the dinosaur on the top half. This sequence allows the audience to compare sizes of the two subjects on screen while seeing them look up at the behemoth like in Figure 3.11 [8].

Figure 3.11: Framing used to demonstrate size and exaggerate a dinosaur. [8]

Modern movies like Pacific Rim, Jurassic World, Godzilla, and Kong: Skull Island have incorporated this technique when displaying the outrageous size of their monsters. Camera angles are not the only thing that is used to emphasize aspects of a monster. Most cinematographers use a technique called forced perspective to convey size differences between subjects. This is different from using camera angles, because the audience can witness two drastically physical forms of characters interact with each other without the feeling of someone being more powerful than the other. Director Peter Jackson, *The Lord of The Rings Trilogy*, has used this approach to indicate the size difference between the Hobbits and normal sized characters. Having the characters stand or sit from afar manipulates the human visual perception into believing that the hobbits are scaled smaller than the other characters within the same scene [32]. This practice can be seen in Figure 3.12 and Figure 3.13. The movie *Elf* has also used this technique to distinguish between humans and elves (Figure 3.14). Using in camera techniques created astounding visuals that pulled the attention of the viewers and created a realistic essence of a character.

Figure 3.12: Process of setting up actors, so that it looks like Gandolf is sitting beside Frodo. [32]

Figure 3.13: Example of forced perspective being used to so the hobbits look smaller compared to Gandolf. [32]

Figure 3.14: Modern movies like Elf still use this technique to create creatures like elves. [12]

3.3 Combining the use of Practical and CGI

A monster's purpose in a movie is to invoke fear in the audience and the protagonists. Earlier films had a multitude of practical effects to create masks and costumes to create the classical monsters. The filmmakers had to rely on set designers to make realistic settings to convey a believable monster. The problem that occurred with older film techniques is the unbelievable aesthetics that were shown on screen. With technological advancements in the past years, filmmakers could incorporate computer generated effects in their movies. Filmmakers can now produce fabricated effects that compel the story forward, and make more menacing antagonists throughout the movie. Some artists suggest that CGI or too much CGI makes a film bad. Like practical effects, if CGI is produced poorly, it will be deemed really bad, resulting in a uncanny feeling and a terrible film. [57]

Modern directors have accomplished the ability of combining both CGI and practical effects as one and making a more extravagant film. By combining CGI and practical effects, they were able to create the best results from both processes. Filmmakers have the opportunity to use make up artists to manufacture a creature that other actors can react to. Having genuine reactions from the other actors generate a better movie than actors having to react to something imaginary. At the same instance, directors can incorporate CGI to exaggerate certain aspects of the monsters and make them improve. The first innovative movie that correctly combined both CGI monsters and practical monsters was Jurassic Park. Steven Spielberg used animatronic dinosaurs on screen when the actors needed something to interact with. In the scene where the actors are in the tree and a Brachiosaurus comes up and starts grazing, the filmmakers created and used an animatronic. The actors got to experience the detailed designs of the robotic dinosaur and respond with its movements as well(Figure 3.16). Spielberg used other animatronics, such as the sick triceratops and the T-Rex (Figure 3.15). Having these practical monsters helped with scenes involving the monsters having to interact with props, like the T-Rex attacking cars and terrorizing the children trapped in them (Figure 3.17). Spielberg not only used animatronic puppets in Jurassic Park, but he utilized CGI where it was appropriate to achieve what animatronics could not do. When the actors first see a Brachiosaurus trying to eat on top of the trees, a CG model was used and animated so that it looks more fluid in movement than an animatronic would look (Figure 3.18). During the stampede scene, CG models were used to simulate an overwhelming and dangerous predicament for the protagonists (Figure 3.19). The use of CG dinosaurs made it possible to have scenes where dinosaurs need to

have more realistic actions. Steven Spielberg's Jurassic Park was an iconic movie in history because it utilized the perfect mix of CGI and Practical effects. [8]

Figure 3.15: Animatronic triceratops that allowed interactions between dinosaurs and actors. [8]

Figure 3.16: Animatronic brachiosaur that allowed interactions between dinosaurs and actors.[8]
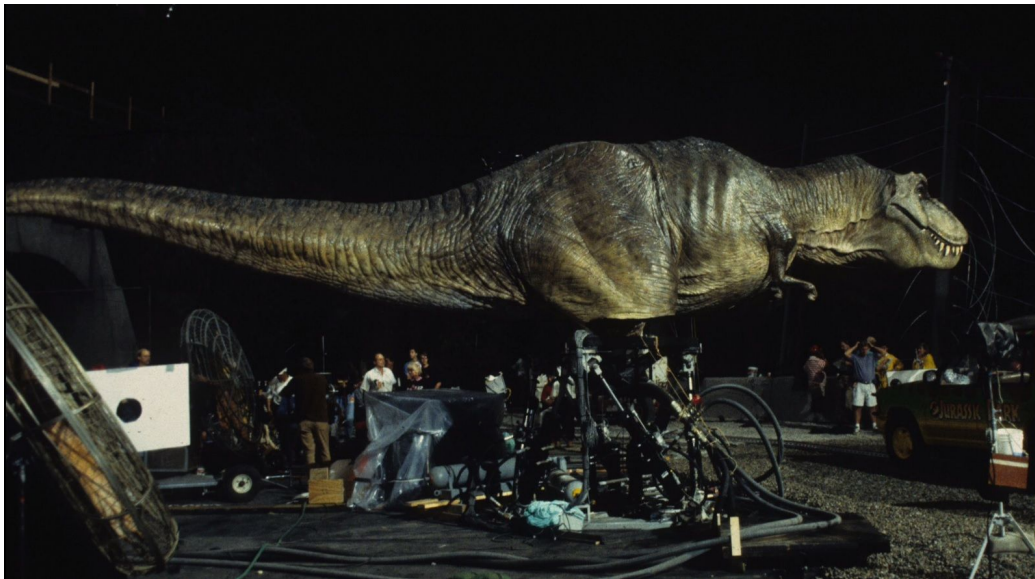
Figure 3.17: This T-Rex animatronic being used in the car scenes.[8]

Figure 3.18: CGI dinosaur composited into a shot with people.[8]

Figure 3.19: Example of crowd generation to have a stampede of dinosaurs in this scene.[8]

Other directors have incorporated the use of CGI to enhance the imagery of their creations. CGI can be used to create amazing landscapes and scenery that could take longer and far more resources to build using practical effects. Peter Jackson used CGI in Lord of the Rings to generate the imaginary world that was imagined by J. R. R. Tolkien. With the use of CGI, Peter Jackson had the opportunity to expand what was not available on set like in Figure 3.20. Other movies adapted this use of CGI as well. *Mad Max Fury Road* (2015) included minor visual effects to amplify the scenery and immerse viewers in the post apocalyptic era (Figure 3.21). Evolving and incorporating this technique into film making has allowed directors to expand their visuals and forge a new line of cinema. It has allowed expressive tendencies that reinforced the ideas of a monster and the possibility that they could exist in cinema space.

Figure 3.20: CGI to extend a set to create the magical world of Rivendell. [32]

Figure 3.21: Mad Max: Fury Road demonstrating how CGI can be used to extend sets. [24]

3.4 Advantages of CGI

There has been plenty of flaws when it comes to solely using practical effects: the disconnected feeling of realism because of an aspect of the make-up or costumes or an unsettling characteristic that throws off the immersive experience for the audience. The spectators of cinema are not the only people that can benefit from CGI. Actors that had to wear prosthetic costumes that were not up to relegated standards endured harsh conditions that drained them. Jim Carrey, played the role of the Grinch in 2000, had to experience the grueling process of applying the costume. The makeup took hours and once he was in it he would have to stay there for a good length of time in order to avoid having to go through the process over and over. Since he was on set for such an extensive time, Jim Carrey had to withstand the amount of heat and irritation that the costume brought upon. During interviews, Jim Carrey mentioned the process of putting on the Grinch costume as "It was like being buried alive each day". It was so demanding that the actor compares it to torture and revealed that he had torture endurance training to complete the movie [37]. Many actors go through this process when working with practical makeup, and this could be improved by utilizing the use of CGI. [42]

More frequently than not people think that the utilization of CGI is a terrible thing. Armond White states "Hollywood relies on digital effects to emphasize lavish other-worldly environments to give audiences what they want: escapism. But there is also an escape from credibility happening here. Special effects used to bring us closer to realism; now they douse us in deception". For many audiences, practical effects is the way to go because they believe it creates a better quality film. Some movies that prove this theory is The Mummy Returns (Figure 3.22), Hulk (Figure 3.23), and Justice League (Figure 3.24). Poorly executed CGI stands out to any audience, which results in a bias against the art.

Figure 3.22: Poorly made CGI model of the scorpion king in *The Mummy Returns*.[42]

Figure 3.23: Model of the Hulk from the movie in 2003.[42]

Figure 3.24: Bad compositing work done on the face of Henry Cavill in the Justice League.[42]

Incorporating CGI not only is beneficial to any movie, but when executed right would create a better movie experience for the audience. The application of CGI has improved the representation of monsters more than practical make up alone could do. The Planet of the Apes was released in 1968, and it astounded audiences with the use of prosthetic costume designs to portray humanoid, intellectual primates. With the series being such a success, one comes to wonder why it has essentially been re-made for modern cinema. Technology has adapted and evolved with time and it altered the approach in creating a monster for movies. The older movies relied on using latex masks and costumes on top of actors to make the illusion of these apes having human characteristics. The actors would not only be able to move and mimic an ape, but this would allow the actors to speak on camera to other actors. This was one of the first movies to portray this type of monster and it amazed audiences around the world. The spectacle of seeing this effect on screen was revolutionary for its time, but there were some flaws when using just costume design. Since the masks were a layer of latex, it did not adhere to the facial muscles that are correlated with lip formations. The performances of the apes were uncanny to see because most of the time when the apes were talking all the viewers would see were mouths opening and closing. Since facial expressions require plenty of distinct muscles to be expressive, wearing masks hinder the opportunity to display more emotions as shown in Figure 3.25. With the new release of the re-imagined Planet of the Ape series, a new approach was taken to generate a convincing ape. The use of CGI was incorporated to produce a computerized chimpanzee instead of using masks and costumes on real actors. This allowed filmmakers to combine both animation and performance capture on top of the CG model. This approach created a realistic ape character infused with the heart and soul of an actor's performance. With motion capture, facial expressions are more expressive and believable making the CG ape more convincing, A variety of expressions can be seen in Figure 3.26 through Figure 3.29.

Figure 3.25: The Latex masks used in the older Planet of the Apes only allowed for a minimum of facial expressions to be seen on camera. [6]

Figure 3.26: Caesar displaying the emotion of anger in *Rise of the Planet of the Apes.* [19]

Figure 3.27: Caesar displaying the emotion of sadness and pain of being left behind in *Rise of the Planet of the Apes.*[19]

Figure 3.28: Caesar displaying the emotion of sadness in *Dawn of the Planet of the Apes.* [21]

Figure 3.29: Caesar displaying the emotion of sadness in *War of the Planet of the Apes.* [29]

Another possibility resulting in the use CGI is to have movements that look realistic compared to the live counterparts. Though modern studios do incorporate the use of clay-mation to make some memorable movies, the process does take a lot of time to focus on minuscule details to make it look continuous. One problem with monsters in older cinema is that they looked fabricated. Movement was the identifying factor in which the credibility of a monster is determined. The King Kong puppet used in the 1933 resulted in a choppy animation because it was animated using stop motion (Figure 3.31). Although it was considered a successful film, there were some uncanny aspects that made the monster unbelievable. The same visuals were seen in the early Godzilla films because the costume could not allow realistic motions. The static animation made scenes aesthetically displeasing because the movements were not as fluid as the human actors on screen (Figure 3.30). This jarring juxtaposition between the two movements created a disconnect that they belong in the same world. With the use of CGI, animators can study how animals move and mimic that on the 3d models. CG animals will have more fluid animations that portray a real animal versus the stop motion animals. Even with the use of robotics, the monsters would possess an unnatural movement to them which can be unnerving to audiences. With CG models, animators can add artistic characteristics to any animation to create visuals that are naturally believable. Animators can incorporate easing

in and out to add mass to any character, as well as adding arcs to have natural motion. These animation techniques are integrated into all forms of CGI, and it is used to appeal to the audience and create a better blend of CGI and realism. The CG models used in King Kong (Figure 3.32) and Kong: Skull Island (Figure 3.33) were animated with references to create a more realistic monster.

Figure 3.30: Based off the costume designs in *Gojira*, there was limited movements. [77]

Figure 3.31: The puppetry when played with other frames is choppy to viewers. [31]

Figure 3.32: The representation of Kong in the 2005 film was the first CGI model that had memorable animation. [14]
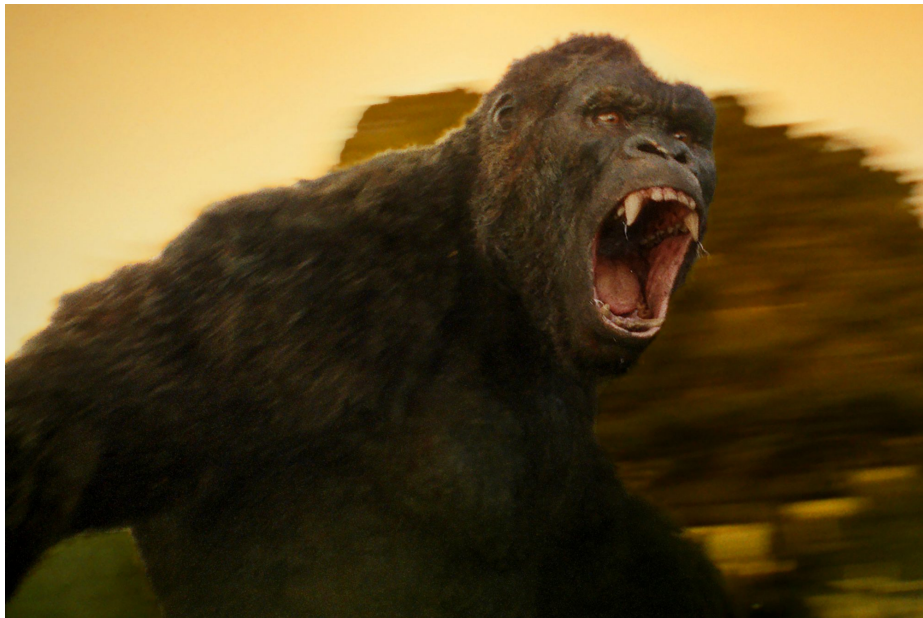

Figure 3.33: Even though the kong model in the 2017 film is based off a neanderthal, the animators were able to provide believable motions to the creature. [26]

CGI has opened up a world of possibilities when it comes to developing and representing unnatural fears. With modern technological advances CG artists have recreated a representation of monsters of all sorts. Fur simulation, for instance, has advanced in the last decade, allowing artists to create realistic hair and fur. *The Incredibles*, was a massive forward step in progress for the CGI world. It included models with natural hair that looked like it belonged on the models. The hair was moving and flowing in relation to the models, having secondary velocity that was influenced by the character's movement (Figure 3.34) [79]. This technology has progressed even more to help with characters that are personified animals. Movies like *Zootopia* that have characters of all nature, have been studied in real life to get their fur to look as realistic as possible. What makes Zootopia visually impressive is that the characters are so stylized, but the fur on them looks so realistic. The fur in Zootopia has reflective properties and flowed in relation to the character's muscle system, which results in a authentic look [53]. This fur system is also used in the modern Planet of the Apes trilogy to re-create CGI apes that destroyed the cities(Figure 3.36) (Figure 3.37). The use of CGI fur is especially customizable so that it could create many different fur patterns on different types of apes. The key to a realistic fur sim is adding noise. Noise generates an irregularity in the appearance of fur and makes it look less uniform [64]. With the steep advancement of Fur simulation, there is an excess of movies that include CG animals now. There are many of factors that can be altered like density, length, and tapers, which influences the look of the fur. This allows more artistic control and better animals or monsters to be computer generated for film. [64]

Using CG to broaden the imagination of artists is a huge asset because it allows the artists to achieve what they envisioned. Modeling allows creatures to be visually menacing compared to masks and costumes. Animation brings a real world sense of motion to the monsters instead of blocky animations. FX incorporates realism to the world that the CG monster is in. Computer Graphics has aided in creating the frightful monsters and with the continuing advancement in technology, it will be utilize to make even more monsters in cinema.

Figure 3.34: The Incredibles introduced the Marschner Hair shader, which includes multiple bounces of light to create an astounding result.

Figure 3.35: Progress of Fur generation in Zootopia.

Figure 3.36: Displaying hair guides on Ceasar vs. Render fur. [21]

Figure 3.37: With the years of advance technology, artists have generated realistic hair. (War of the Planet of the Apes.) [29]

Chapter 4

Design Influences

4.1 Monster and Environment Designs

My thesis monster was inspired by the works of German Expressionism combined with historical monster conceptions. Since I was interested in Leo Braudy's fear of nature, I wanted to make a mutated monster based off of a natural creature. Learning that most of the earlier monsters were fabricated based on fossil discoveries, I wanted to integrate that into my creature design. For the prehistoric creature I selected the Dunkleosteus, an armored fish during the Silurian (roughly 443 million to 416 million years ago) and Devonian Period (roughly 416 million to 358 million years ago) [51]. Based off other artist's renditions, the Dunkleosteus had accented bone structures and dense plates to make the armored appearance.

Figure 4.1: Artist rendition of the Dunkleosteus.

Figure 4.2: Recreation from Bob Campbell Geology Museum

Figure 4.3: Recreation from Bob Campbell Geology Museum.

Figure 4.4: Front Progress Pic original   Figure 4.5: Front Progress Pic iteration

That armored imagery was then applied throughout the body so that the monster has a continuous and consistent appearance. To accomplish the monster's armor pieces, I masked pieces on the monster and extruded it from the body to create an illusion of plates. The detailed structures complement the harsh strokes of the German Expressionist painters, resulting in a scarier and frightful monster. While modeling my monster in Zbrush, Professor Insun Kwon suggested that I accentuate some details to give it a better silhouette. Having a rounded back and broader shoulders make the monster look massive and scarier. I added more details to the head of the monster so it looks more like the Dunkleosteus (Figure 4.4 through Figure 4.9). Another improvement that was implemented was having an oversized back fin to emphasize the terrorizing size of the body. The appendages were first sculpted with the idea that the sizes would be proportionally similar to a regular human, but after some feedback they were enlarged to give the the creature a more monstrous figure. Having abnormal sized hands and feet creates the dysmorphic ideas that create the idea of a monster (Figure 4.10 and Figure 4.11). This idea of body dysmorphia is in a lot of movies. Guillermo del Toro used his personal issues with body dysmorphia to create the Pale Man monster in Pan's Labyrinth, which is why I incorporated the idea of body dysmorphia into my thesis monster as well.
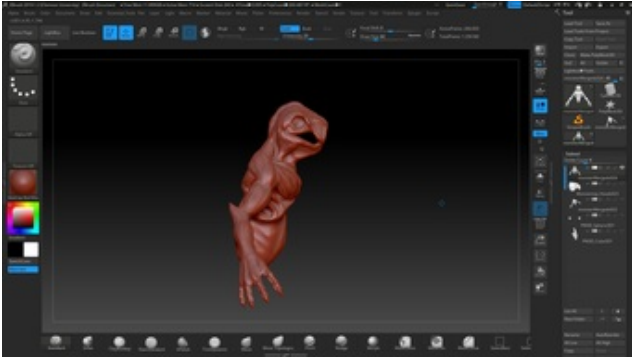
Figure 4.6: Side Progress Pic original

Figure 4.7: Side Progress Pic iteration
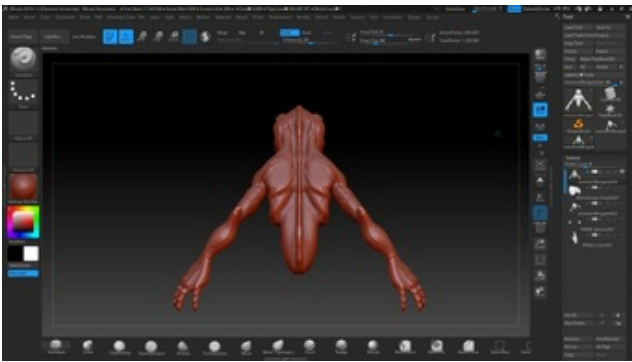
Figure 4.8: Back Progress Pic original
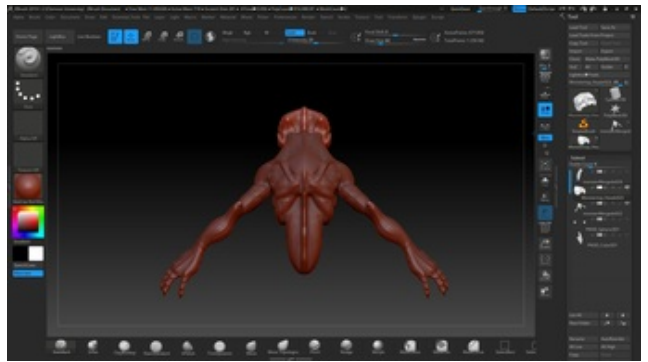
Figure 4.9: Back Progress Pic iteration

Figure 4.10: Past Sculpt

Figure 4.11: Final iteration

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The overall form was inspired by Kaijus, popularized by Japanese culture. Movies like Godzilla and Pacific had the theme of a giant aquatic creature terrorizing the cities, so I incorporated that design in as well. Guillermo Del Toro directed many movies with aquatic monsters and I referenced his films: *Pacific Rim*, *Hellboy*, and *Shape of Water* to imagine the body of my creature. I wanted to mimic the way a marine monster could be terrifying, but still have humanoid features, so his designs for Abe Sapien were a good resource. Other than the oversized appendages, the monster follows the design of having a slimmer body like the monsters from Guillermo del Toros movies. Having fins on the forearms and calves were inspired by the sea creature from *The Creature from the Black Lagoon* (Figure 4.12). For the base form I referenced a lot of creatures in Figure 4.13.

Figure 4.12: Some influences from Creature from the Black Lagoon.[4]
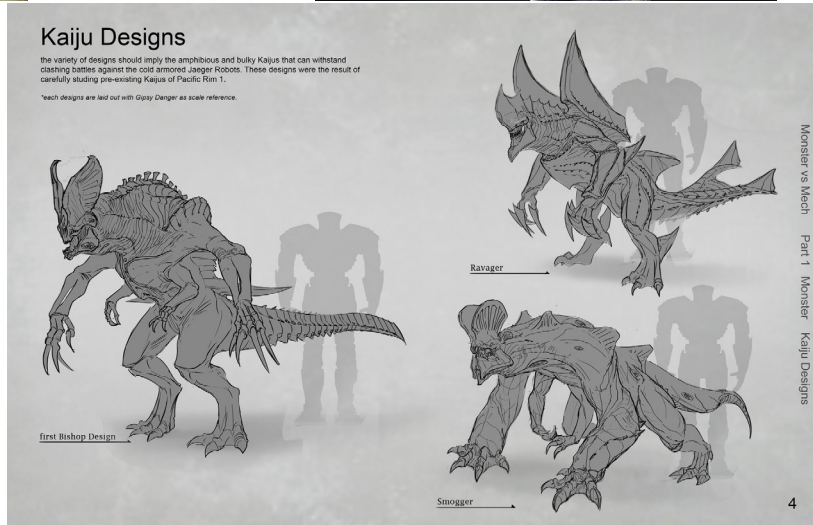
Figure 4.13: Some references that inspired my creature. [4]

Adding fish scales and fins drives the concept that this is a naturally mutated fish, like the fears that the Japanese had when imagining Godzilla. His distinct details like augmented limbs, inspired by Kaijus, were blended into my monster design to make a more menacing monster. The concepts, drawn by grad student Alex Schlesener, intertwined some of the slimmer physiques of Abe Sapien and characteristics of the Placodermi.
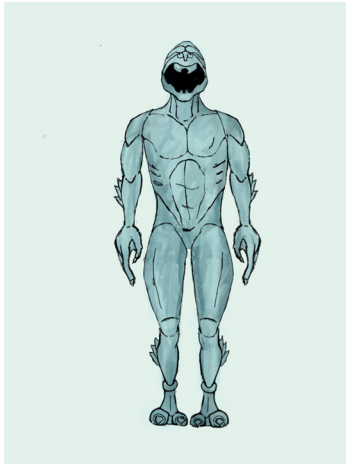
Figure 4.14: Front View Concept by Alex Schlesener
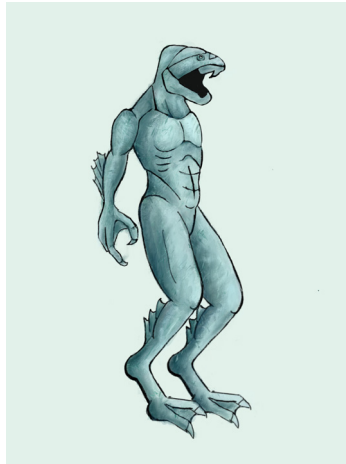
Figure 4.15: Side View Concept by Alex Schlesener
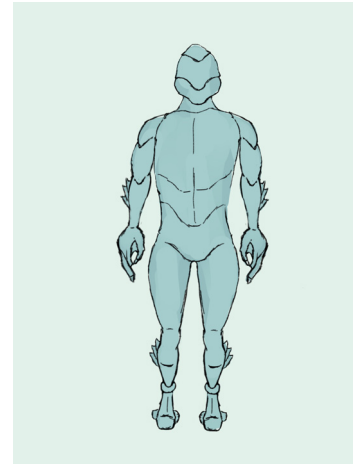
Figure 4.16: Back View Concept by Alex Schlesener

The reasoning of my creature design, is influenced by nature more than the fictional. Though based off the Dunkleosteus, the functionality of the monster has to mimic aquatic creatures that functioned with hinged joints. One animal that came in mind is the Parrot Fish. The parrot fish mouth functions as a snipping/chomping mechanism and I wanted to incorporate that in my design [66]. Having a more humanoid creature allows the audiences to relate more to the creature, like in Shape of Water. Having a humanoid creates an uncanny connection between the viewer and audience. It also allows audiences to see non proportional features that they can base off the human standards. The hands needed to be bigger to cover more surface area, if the creature needed to swim. The augmented fins are just not aesthetically scary, but serve the purpose to break the water surface tension when the monster is swimming. Almost like the sharks and dolphins when they breach water.

For the environment I researched movies of the German Expressionist era, the works of Tim Burton, and comic book artists. A common theme of jagged edges and sharp angles in the overall frame was important to this art movement. With the suggestion of Professor Anthony Summey, I researched the artwork of Hellboy's comic book artist Mike Mignola. Within his artwork his 2D architecture combined with his harsh and abstract outlines created fantastic silhouettes that resembles the German Expressionists era. Some of his art style can be seen in Figure 4.17 through Figure 4.19.

Figure 4.17: Oddest Jobs by Mike Mignola.[61]
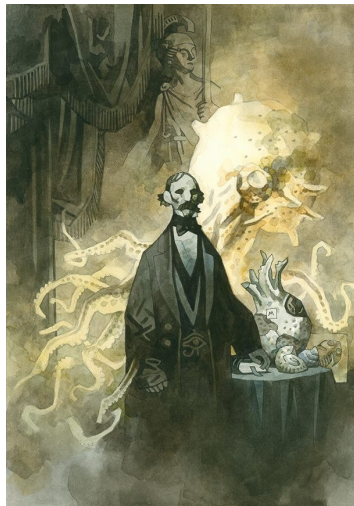
Figure 4.18: The Luminous Knob by Mike Mignola[61]

Figure 4.19: Thing on the Roof[61]

Since Tim Burton was influenced by German Expressionism, he included a lot of the art movement in his films. His movies are always set in a surreal and unnatural environment and I was inspired to include that in my shots as well. His movies always incorporated the jagged environments, or unwinding scenery. Some of his movies that inspired me were *Alice in Wonderland*(Figure 4.21) and *Nightmare before Christmas*(Figure 4.22) because the overall usage of unnatural shapes to create an environment. Tim Burton used a lot of borders to accentuate the characters to match the Expressionist movement. One aspect that he really emphasizes is Chiaroscuro with his make up design, while I incorporate this technique through lighting. By using harsh contrast, made a more frightful monster like the image of Sweeney Todd (Figure 4.20).

Figure 4.20: Frame form Sweeney Todd, where the bold background counteracts framing. [17]

Figure 4.21: Frame of Alice in Wonderland showcasing the surrealist environment. [18]

Figure 4.22: Obscure angles in the environment creates powerful imagery.[9]

I explored the idea of looking at natural elements that are formed with jagged and disruptive edges. Cliffs and rocks that are common by the ocean were good representation of natural German Expressionism. The way they are formed creates silhouettes that imitates the features of set designs of the Cabinet of Dr. Caligari and Metropolis (Figure 4.23 and Figure 4.24). Since my overall theme is to incorporate the use of silhouettes, the lighthouse was an interesting piece to model. Most people would think a lighthouse is more cylindrical, so it was interesting that there are some lighthouses that have defined edges. The Murmansk Lighthouse was a wonderful reference, because it is defined enough to cast harsh edges, while holding on to its lighthouse architecture (Figure 4.25) [72]. Using natural objects to create a surreal environment aids in the illusion of a monster.

Figure 4.23: Some rock concepts I looked at while deciding my designs.

Figure 4.24: More concepts of oceanic rocks.

Figure 4.25: The Murmansk lighthouse with its defining structure. [72]

4.2   Surfacing

Being inspired by a lot of Guillermo Del Toro films, the surfacing imitates the stylistic choices of his films: Shape of Water (Figure 4.26), Hellboy (Figure 4.27), Pan's Labyrinth (4.18), and Pacific Rim. With the help of fellow graduate student Alex Schlesener, we based the monster's color tones to match some characters from those movies. Since this is an aquatic creature, I wanted this to be more on the cooler side of the the color spectrum by applying a bluer tone all overall. There was a mixture of teals and whites added in to achieve a gradient of color to resemble fish colors (Figure 4.29). The textures applied generates the appearance of a layer of skin over the armor pieces making this a more ferocious monster. For the rocks in scene 1, I wanted the monster to blend into the jagged rocks, so Alex painted the rocks a bluer tone, mixed with the natural look of textures. The objects in my scene have harsh edges and textures, to go along with the design of the monster, but also pay homage to the German Expressionism set designs.

Figure 4.26: Color design of the character in the Shape of Water.[27]

Figure 4.27: Some resemblance in the Abe Sapien and Shape of Water. [13]

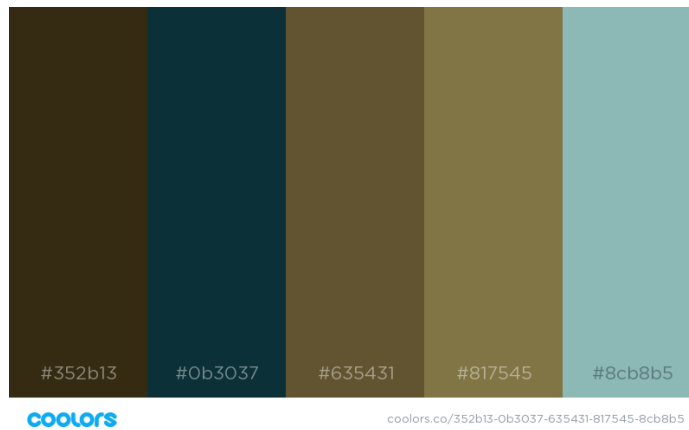Figure 4.28: The Faun from Pan's Labyrinth also has the same color scheme I was looking for. [16]

Figure 4.29: The Color reference we decided on when Alex was surfacing.

4.3 Animation

Animating a monster is a challenge because monsters are fictional, and there are no real life references to study. For my studies I watched movies like Godzilla 1 and 2, King Kong, and Pacific Rim. My focus is on how the animators were able to give a creature performance for a monster that is not based on any real animal. For King Kong there were immense arc motions added to the massive ape to demonstrate a behemoth of a monster. The Kaijus in Pacific Rim and Godzilla also moved with massive arcs to convey their massive size. I infused this motion in the shot to convey the massive monster. The monsters I referenced also moved slower and with more pauses and cushioning, revealing that they have a lot of mass to move around. With these case studies and the help of fellow grad student Kayla Rutherford, we have animated the monster to portray the tropes of the cinema monster. This includes adding a lot of cushioning when their is a transitioning of mass, and adding secondary motions to make this monster terrifying. To add to the animalistic tendencies, Kayla suggested adding a shimmy or shake when the monster gets out of the water. This correlates to some mammals that need to dry off after getting wet, which results in adding some realism to the monster's movement.

4.3.1 Lighting and Composition

For lighting, I wanted to pursue the lighting designs that were a part of the art form of Chiaroscuro. This art form was incorporated during the German Expressionism era, demonstrating the high contrasts that caused harsh shadows that engulf the scene and characters. Popularized by the film noir dramas, the excess of shadows generated ambiguity in a scene and added a layer of mystery to the overall scene. Tim Burton, who was influenced by German Expressionism, adapted this technique and incorporated it in a lot of his movies to have stylistic aesthetic, The use of these harsh shadows is a technique used in cinema not only to create an eerie composition, but it is used to hide certain details from the camera and the audience. This applies to my production because I wanted to incorporate that in as well. I wanted to use shadows to my advantage to establish a nighttime setting, as well as incorporate the illusion that the monster is an enigma. In the production, I also modeled a lighthouse that needed to emit light like in real life. Having a lighthouse emit through a fog creates an outline of the light which is another angle in the composition. To accomplish this I needed to light something using crepuscular rays which added to random angles

in composition just like German Expressionist films. For a realistic lighting set up for the lighthouse, my research taught me that a lighthouse rotates a full cycle in seven seconds. Maya has an animation technique that allows you to offset the output of the key animation. I simply set a key animation on the rotation and made the offsets linear so that the lighthouse will always rotate every seven seconds. The Sin City movie series influenced my use of harsh shadows and contrasts because not only did director Robert Rodriguez follow the artistic styles of the comic series, he also transformed the comic book pages into astounding visuals through cinematography and lighting. Some of the lighting can be seen below in Figure 4.30 and Figure 4.31.

Figure 4.30: Screen grab from the movie Sin City. [15]

Figure 4.31: Screen grab from the movie Sin City. [15]

Camera composition and layout were my interests in undergraduate studies and I wanted to integrate that as much as possible with CGI. While studying at UNCW, I was fascinated on how framing changed our perspective on characters. Certain angles altered how we perceived a character, it could be make a character look superior or it could make a character feel inferior. My influences were the classical monsters movies like Frankenstein and other movies in the German Expressionist era, but modern movies were also influential in my research. Steven Spielberg's Jurassic Park paved the way for cinematography with CGI characters. His incorporation of extreme low angle shots for the dinosaurs emphasized their enormous sizes, especially when they are towering over trees (Figure . I wanted to incorporate that same ideology in my production research. I incorporated a low angle shot that frame the monster as it rises from the ocean, adding the effect it towers over the camera. Framing the camera to point even higher at the monster's peak of action creating an exaggerated enhancement in height. One characteristic that influenced the birth of monsters is the misconception of what civilizations have seen or the lack of what they have seen. I wanted to integrate this trope into all of my shots. In shot 1, I designed it so that the monster is hidden in the rocks, so that viewers will mistaken it as another rock. After a moment the monster will rise and break the illusion that it is another environment piece. For shot 2, I used the lights to cast harsh shadows throughout the cave. What I wanted to achieve is the monster to be hidden for most of the shot and to have a reveal of some of the scarier details of the monster to appear at the end. Utilizing the shadows as a veil creates ambiguity on what the monster looks like, which generates mystery and allows viewers to fabricate some features of the monster.

Figure 4.32: Screen grab from Jurassic Park showing how Steven Spielberg used a low camera angle (Figure 4.32). [8]

4.3.2 FX

The key to a believable CGI monster is to have it interact with real world elements. Side FX's program Houdini is a powerful tool that is used to recreate CGI effects like fire, water, or dust. My process was to take the master layout file with every object in it and to have water react to all of it. I started by Alembic caching the entire master layout file and importing that into Houdini. From there, I had to transition the scale factor of the monster to follow Houdini's meter system. I wanted the monster to roughly be 20 meters tall so I used Houdini's default human object and matched the scale of my monster with that. Houdini allows users to create collisions, so I had to make two collision factors. One for the static objects like rocks and island, and I had to make a Hero Collision for the monster to be able to move and interact with the water. Houdini assigns the monster Geo as a mesh component that the software can read it as "collidable". This type of collision uses a per-face collision for complex geometry. This results in accurate collision calculations that will result in collisions happening in minute details [78].

Houdini's wave tank gave FX artists the opportunity to adjust aspects of the ocean to make some realistic ocean visuals. I was able to adjust wave heights through speed, direction, wind direction, and even water levels. Houdini allowed creative choices to real world effects which created oceans that could follow any type of natural environment. On top of the wave tank tool, Houdini has a spray tool that calculates velocity of the particles and emits foam and spray to places with higher velocity and should create a physics that relate to a giant object coming out of water. Following many references for using the water sims in Houdini, I know that to make water more realistic I needed to lower the particle separation. To get the fine details in water, a smaller particle separation would have more points to calculate [68].

Houdini is also used to generate many environments which is utilized in this production. To achieve the look effect of having multitude of trees, Houdini allow artists to have many trees that are different in several aspects and to copy those to points on any geometry. With the copy stamp node, I was able to apply this knowledge onto the points on the cliff and the cave objects. A switch node is used to randomly pick among the different trees I have created. Certain attributes in the copy node could also be changed to achieve more variety within the points like scale and rotation. This creates a random assortment of different scaled trees on top of having them randomly turn on a certain axis so the scenery looks more unsystematic [80].

Chapter 5

Final Renders

5.1 Model

Figure 5.1: A close up of the chest details.

Figure 5.2: A close up of the back details.

Figure 5.3: A close up of the legs.

Figure 5.4: A close up of the enlarged hands.

Figure 5.5: Monster turnaround.

5.2 Surfacing

Figure 5.6: Top half of the monster in the lighting setup for both shots.

Figure 5.7: Surfacing of the torso.

Figure 5.8: Another angle of the surfacing of the monster.

Figure 5.9: Another angle of the surfacing of the monster.

Figure 5.10: Full body of the surfaced monster.

5.3 Animation 1

Figure 5.11: Shot 1

Using the tropes of old monster movies, I positioned the monster to hide within the rocks until it needed to rise. The light was positioned to cast shadows on the right side of objects. The lighthouse also emits a different angle of light to counteract the lighting of the main light. (Figure 5.11)

Figure 5.12: Shot 2

I incorporated Steven Spielberg's use on low camera angles so that the monster appears gigantic. I also animated the monster to take a step over the camera to aid in the enormous size.

There is also composited water fx. (Figure 5.12)

Figure 5.13: Shot 3

5.4   Animation 2

Figure 5.14: Shot 1

Being inspired by Tim Burton's surreal environments, I created a landscape with a distinct silhouette. Using one light source I was able to achieve the Chiaroscuro. (Figure 5.14)

Figure 5.15: Shot 2

With this shot, I utilized the shadows to conceal the monster, but viewers can see a slight figure walking out of the cave. (Figure 5.15)
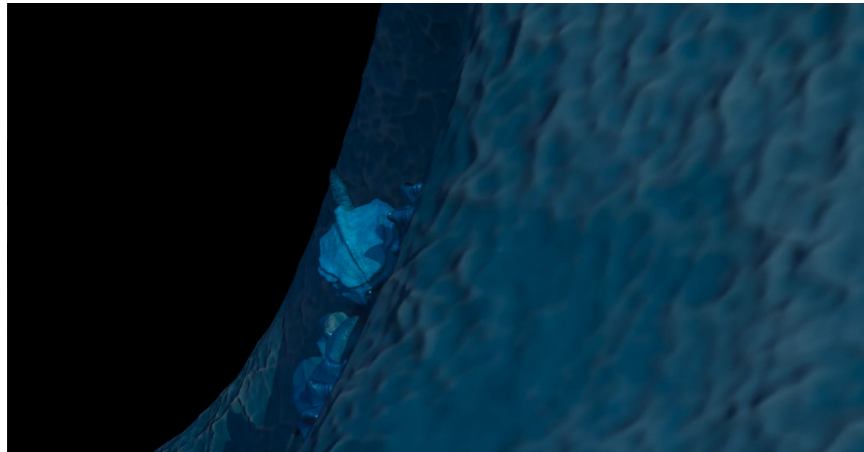

Figure 5.16: Shot 3

The final shot reveals the monster, as it pops its head out to look at the audience.

Chapter 6

Conclusions and Discussion

6.1   Outcome

Overall I was pleased with the outcome of the production side of my project. I enjoyed taking my fascination of monsters and creating shots that employ the use of software the Digital Production Arts Program has taught me. I was able to incorporate lessons, influences, and styles of historical monsters into a world of computer graphics. It was interesting to see that different era movies share the same techniques to make their monsters captivating to audiences and I was happy I could use the same techniques in my animations.

6.2   What I Would Do Differently

6.2.1   Story

Since I wanted to focus more on Layout and FX, the story behind the monster was lacking some information. If I were to remake a story that revolve around Animation 1, I would have created an exposition of why and how the monster came to be. It could be from radiation, mutation, or something that was living inside the Earth and emerged to wreak havoc on society. I would create an interrupting news story that would explain some type of event, like an oil spill, that would lead into the environment the monster is from. It would transition into finding of Giant footsteps found on beaches that belong to the monster. Then cut to the start of my animation.

6.2.2   Surfacing

The texturing was almost complete. There were some instances that needed to be addressed and if provided more time, I could have made those changes. Scale was a factor in determining the size of my monster. The scale of the textures of the monster was fine, but the scale of the details of the environment needed work. The textures of the environment were too large and didn't make the monster appear as a giant, but more of an average size monster in the ocean. Having a scalable texture would make the size relationship more noticeable.

6.2.3   Layout and FX

The layout I made was mostly what I envisioned when I started the project. The only issue I ran into was the trying to incorporate an extreme low angle shot of the monster emerging from the ocean. When I attempted the camera was going underneath the water and with the current shader, I could not see anything. I settled with a low angle shot which achieves the powerful imagery, but not as powerful as an extreme low angle shot.

FX takes an excess of time to accomplish and near the end of the production I did not allot an appropriate amount of time to check iterations. The water still looked blobby and it was not what I envisioned when I was doing research. Since I wanted the monster to be twenty meters tall, I mistakenly made the monster twenty meters tall in Houdini. Going back and reading up on Kevin Pinga's article on Flip Fluids, I would adjust the size of the monster to normal size. This would result in faster simulations and more details in the water. While compositing, I also saw that the water FX was not interacting with the rocks on camera, so I would adjust it to only interact with the monster. This was a main reason the simulation was taking an excess amount of time to cache out and it should be a lot faster if I only interacted with the monster.

6.2.4   Rendering and Compositing

Rendering from Maya was not too complicated since Clemson's render farm finished a multitude of frames at the same time. Since I used Maya 2016, the only issue I had was trying to get the right render passes to render. I needed the Z-depth pass to bring into compositing to change focus on my animations, but that render passed failed multiple times. With Houdini, the render passes failed a lot and I didn't have time to figure that out. With more time, I could trouble shoot

the problem with Houdini's render pass in relation to Clemson's render farm. With the right render passes, compositing would look better too. Some of the nodes in Nuke did not work with broken render passes, so I settled with a basic composite for both animations.

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