



Animal Movements Exploration to Animate Fantasy Characters for Video Game “Guns and Monsters”

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Abstract: Fantasy characters such as dragons, hydra, loch ness, chimera, and other creatures are often visualized with animation media, which are then made into films and games. However, to create the animations of these creatures' motions, it is necessary to consider the proportions of the body, characteristics, and principles of animation so that they look appealing. Observing animals that resemble the character and exploring their movements in animation is crucial to making the movements seem natural. Therefore, this study focused on animating a fantasy character based on animal movements. The method used in this study is a qualitative approach, which includes theory, interviews with players, and creation of works. The experimental animation method is also used to explore combinations of movements. The results obtained from this research are in the form of fantasy character cycle animations in the FPS game called "Guns and Monsters."

Keywords: animation, fantasy, character. exploration, movements.

1. INTRODUCTION

Fantasy creatures or characters are fictional beings created by humans and passed down through generations as part of cultural storytelling traditions. Over time, these beings have become well-known elements of mythological lore and have been widely adapted into various forms of visual art, including illustrations, films, animations, and video games. According to Hentilä (2019), myths and legends developed gradually due to the slow dissemination of information in ancient times. Limited communication between regions allowed stories to evolve differently across cultures, resulting in diverse interpretations of legendary and mythical beings. However, with the rapid advancement of modern technology and global communication, information about mythical creatures that were once localized can now be easily accessed by audiences worldwide. This widespread accessibility has allowed fantasy creatures to remain relevant and continuously reinterpreted in contemporary media.

In modern entertainment industries, particularly video games, fantasy creatures are frequently incorporated as central elements, especially within the fantasy genre. Game developers utilize these characters to enrich world-building, enhance narrative depth, and create immersive interactive experiences. Fantasy characters often spark players' curiosity because of their unusual forms, mysterious backgrounds, and extraordinary abilities, which differ significantly from real-world beings. As a result, players become more emotionally engaged and immersed in their roles within the game environment. Håkansson (2019) states that high-quality animation plays a significant role in improving the overall gaming experience, as fluid and believable movement helps players connect more deeply with virtual

characters. When animation is poorly executed, characters may appear unnatural, reducing immersion and weakening the emotional impact of the game.

Beyond animation quality alone, the design and characteristics of fantasy creatures are also crucial in making their movements appear believable. Fuyama (2022) explains that animation serves as a powerful medium to visualize fantasy through motion, enabling creators to share imaginative worlds and encourage audiences to explore fictional realities from multiple perspectives. Animation also acts as a bridge that connects human perception with imaginative realms, making abstract or impossible concepts feel tangible and understandable. However, creating convincing movements for fantasy creatures is particularly challenging because these beings do not exist in reality. Animators must therefore rely on a strong understanding of movement of references, creature characteristics, animation principles, and anatomical proportions to construct motions that feel logical and natural.

Gong (2023) emphasizes that animators can produce characters that are more believable and acceptable to modern audiences by incorporating historical and biological realities into their designs. By studying how real animals move, how muscles and joints function, and how weight distribution affects motion, animators can apply realistic movement foundations even to imaginary beings.

The fantasy characters examined in this study are designed based on combinations of real-life animals or hybrids between animals and humans, resulting in distinctive new creatures. Dobrzycki (2020) notes that many mythological beings originate from such combinations of real organisms. For instance, the Griffin is a hybrid creature combining the physical traits of an eagle and a lion, while the Minotaur possesses the body of a human and the head of a bull. These hybrid structures provide logical anatomical foundations that help animators predict movement patterns.

This study aims to improve animators' understanding of how to animate fantasy creatures more realistically by applying the twelve principles of animation alongside careful consideration of references, creature characteristics, and anatomical proportions. By integrating artistic creativity with biological and physical plausibility, animators can create fantasy creatures that move convincingly while still maintaining their imaginative appeal.

2. METHODOLOGY

This research paper employs a qualitative methodology and proceeds with a research-creation approach. This methodology was chosen because it suggests a perspective of resistance and failure as productive and constitutive of possibilities of coming to know, both for the research subjects and ultimately for the authors in their orientation to research inquiry (Georgis & Matthews, 2021). Since this research is focusing on animating a fantasy creature, reference videos and animal anatomy are required. Animation of reference, also known as reference footage, refers to recorded movements and expressions used as a guide when animating a character. In general, large animation studios require animators to seek out or create their own references (Kennedy, 2022).

The data will be collected from animating fantasy creatures of the game "Guns and Monsters", which is a work for a final project in the final semester. The process includes:

1. Pre-production preparation includes the theme of the game, lore, and types of game the team is making.
2. Production includes blueprints for enemy behavior, types of enemies, modeling characters and weapons, and then animating. For animating, will use the observation method of animal behavior/movements.

3. Post-production includes checking if the game runs smoothly and checking that animation has no problems within the game.

2.1 Analytical Framework

To ensure that the animation process is evaluated systematically, this study adopts an analytical framework based on two main components: biological movement adaptation and animation principles application.

First, biological movement adaptation refers to how accurately selected animal references (cat, gorilla, squid, and ostrich) are translated into fantasy characters' motion. This includes body mechanics, weight distribution, and movement of rhythm. Second, the application of the 12 principles of animation (Thomas & Johnston, 1981) is used to assess the quality of animation. Key principles applied in this study include:

- Anticipation
- Arc
- Exaggeration
- Timing and spacing

Each animated character (Melee, Tanker, Airborne, and Shooter) is analyzed based on how these principles are implemented to enhance clarity, impact, and believability of movement.

This framework allows the study to move beyond production and into evaluation, providing a structured approach to analyzing the effectiveness of animal-based animation in fantasy character design.

To assess the effectiveness of the animated characters, this study uses the following evaluation criteria:

1. Movement Believability

The extent to which the animation appears natural and consistent with the chosen animal references.

2. Application of Animation Principles

The use of key animation principles such as anticipation, arcs, timing, and exaggeration in enhancing motion quality.

3. Character Consistency

Whether the movement aligns with the character's design, anatomy, and role within the game.

4. Gameplay Functionality

How well the animation supports gameplay mechanics, including readability of attacks, responsiveness, and player interaction.

5. Player Feedback (Qualitative)

Feedback from playtesting sessions regarding clarity, immersion, and perceived realism of the characters.

These criteria are used to evaluate each animation cycle produced in the game "Guns and Monsters."

2.2 Game “Guns and Monsters”

The game “Guns and Monsters” is a game made for a final project. The game itself is a high-paced FPS game with a *gacha*¹ system for the player’s skill ability or known as *buffs* (Figure 1). The game contains a *gacha* system to make the game continuously playable, as the *gacha* system is currently very popular for video gaming to give addiction effect and attract to the game (Prawida, et al. 2023).



Fig. 1. Homepage the game “Guns and Monsters”
(Personal Documentation)

The story in game “Guns and Monsters” is about a priest in post-apocalyptic world that has been invaded by monsters from different dimensions. The player’s goal is to finish certain waves of monsters’ attacks to save humanity. During the play after a wave, buffs appear to help player for the next wave, and the buffs are different each time it appears. When the player died, they need to start from the beginning and the buff that appears would be different, with a *gacha* system as explained above.

The inspiration for this game’s theme and environment is from Camden, Maine in Knox City, USA. The area has a certain number of churches, showing how people in that area are living religiously. The role of priest saving humanity was inspired by data on the environment for “Guns and Monsters” on Camden, Knox City.

2.3 Monster Types

According to Dobrzycki, M. (2020) in his book “The Art of Drawing Dragons, Mythological Beasts, and Fantasy Creatures: Step-by-Step Techniques for Drawing Fantastic Creatures of Folklore and Legend”, most mythological or fantasy creatures are described as a combination of several types of real-world animals merged into one, including humans. Some examples of combining various living beings to create the form of a fantasy creature include bird wings and bat wings fused together to create dragon wings; a chimpanzee skull combined with a crocodile head to form a dragon’s head; and, lastly, human hands merged with iguana hands to produce a dragon’s hands.

¹ Gacha is a mechanic of a game that gives something random and cannot be picked.

After several discussions, it was decided that the game would have four types of monsters in the game to represent four types of waves that need to be cleared in the game. Each monster gives a different fighting difficulty and requires a different type of gun to fight them, depending on the player’s situation. Melee character was the first one to appear in the game, with its weakness Melee cannot attack when the player is in the high ground, out of its reach. Then comes Tanker, who can throw rocks, making high grounds no longer a safe option for players. Then comes Airborne, a character that can attack in the air and is able to get into a self-destruct mode, which is an instant murder for the player. Last is Shooter, which is fast and able to attack from a distance. The inspiration for the monsters in the game was combining certain animals and making them hostile.

Table 1. Types of Monsters in “Guns and Monsters”

Monster	Monster Models	Monster	Monster Models
Type Melee		Type Airborne	
Tanker		Shooter	

Animating fantasy characters or monsters in the game “Guns and Monsters” started with animal movements/behaviour studies based on the monsters that had already been designed above. According to Dugatkin, L. A. (2020), behavior is the coordinated response of an entire organism to stimuli originating from either external or internal sources. For example, an animal may move to a shaded area in response to heat or when its body begins to sweat. Dugatkin states this definition because it aligns with the understanding of most modern ethologists and behavioral ecologists when they discuss behavior.

3 RESULT

Animal observations and literature are studied for animating these four fantasy creatures. For Tanker, the reference used was the movements of a gorilla. Saito et. al. (2021) stated that human hands evolved for precision gripping, whereas gorillas grip objects not for precision but for the strength exerted. A gorilla palm appears longer than that of a human, which is why gorillas typically use their hands to walk on their knuckles and use their forelimbs for eating and movement. This makes a gorilla’s arm powerful enough to lift heavy objects.

Melee monster is a half-human for its upper body, and half-cat for its legs. A group of researchers, including Wang et al. (2021), stated in their journal that cats are digitigrade animals characterized by carpal bones, metapodial bones that connect the phalanges to the proximal limb bones, and wrist joints that bend downward. The toe bones, which are the main parts of the body that come into contact with the ground while standing, walking, and running, enable cats to support two to three times their body weight when moving with their small distal joints. Upon further examination, this ability may be attributed to the structure of the paw pads, which are composed of thick subcutaneous tissue that wraps around the distal joints. These pads play an essential role in effectively absorbing impact and protecting the distal limb joints from damage.

For animating Airborne, the reference used is squid. Hou et al. (2020) stated that squids can move through water at a maximum speed of 8 m/s, or 8 meters/second. This ability is made possible by the squid's well-adapted body parts, such as flexible tentacles, a strong mantle cavity, and muscular lateral fins.

For Shooter, reference use is from an ostrich. Mahdy et al. (2020) stated that the ostrich is the heaviest and fastest bird among the flightless bird species, capable of reaching speeds up to 60 km/h, due to its strong legs, feet, muscles, and tendons. In addition, Maderspacher, F. (2022), also noted that although ostriches cannot fly, their large wings can be used as steering tools when running and turning, making them fast.

4 Discussion

With four monsters that need to be animated, it is necessary to break down each character's movements of every character. For Melee, it has a walk cycle, run cycle, three three-attack cycles, making Melee have five animations (Figure 2).



Fig. 2. Walk Cycle (left) Run Cycle (right)
(Personal Documentation)

The walk cycle of Melee monsters still uses the normal human walk cycle, since only below the knee are using cat's anatomy. Cat's anatomy and movements are used in Melee's running cycle. It took quite some trial and error to use a cat's movements and found it would be used during Arc - one of the animation principles. The run cycle was technically challenging since Melee's leg has cat anatomy. While walking might be similar to a human walk, applying exaggeration to run cycle requires research, and finally it was determined that its upper heel was closer to its bottom.

Melee character attacks using its claw by scratching the player. Scratching itself also uses a cat's front paw movements.

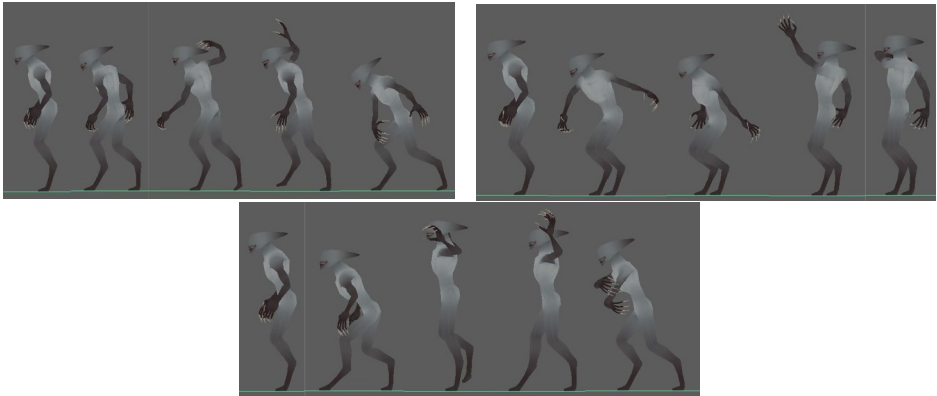


Fig. 3. Melee Attack Cycles
(Personal Documentation)

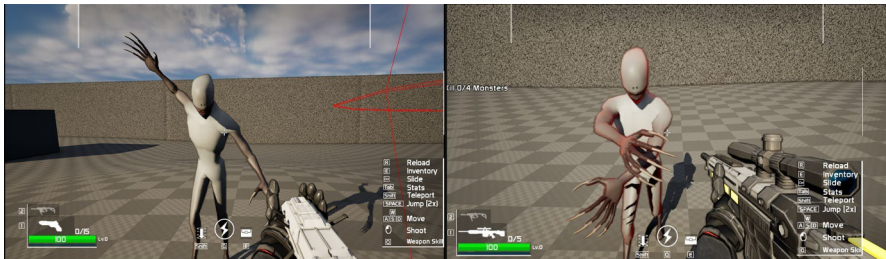


Fig. 4. Melee In-Game
(Personal Documentation)

Due to its fast attack movements, it decided to have 3-cycle attacks (Figure 3). The first attack cycle is a normal cat scratch, which stands like a human and uses its right paw to attack (Figure 4). The second attack cycle combines the movement of a cat's paw for scratching and human upper cut arm movements. The third attack movements use both arms to scratch.

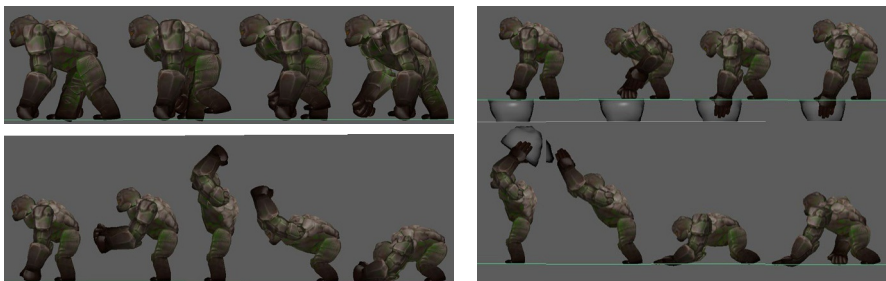


Fig. 5. Tanker Walk (upper left) and Attack Cycles (below left, upper right)
(Personal Documentation)



Fig. 6. Melee In-Game
(Personal Documentation)

For Tanker character, it was inspired by Gollum, a fantasy creature made out of stone, with gorilla-like movements (Figure 5). Since Tanker’s skin was made from stones, its movements were slower. It uses both arms to smash the ground when the player is near and lift a giant rock to attack the player from a distance (Figure 6). After observing gorilla’s movements, its movements revolve around its long arms. Its long arm makes gorillas have enormous upper body strength, shown as it’s capable of pulling a heavy rope and throwing pumpkins. In the game, Tanker character attacks the player by throwing giant rocks.

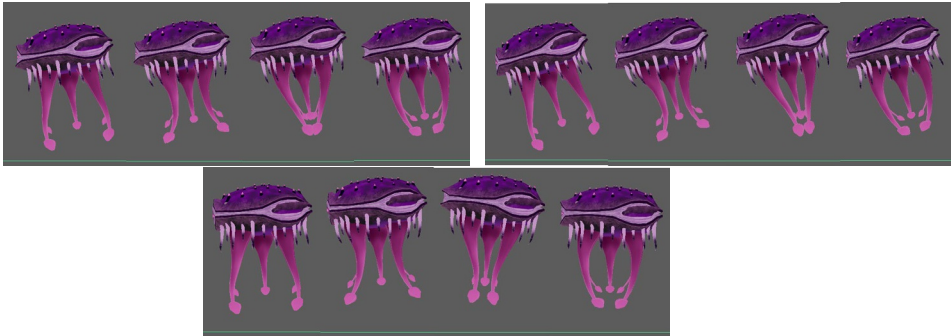


Fig. 7. Shooter Walk (upper left), Run (upper right), Attack (below) Cycles
(Personal Documentation)



Fig. 8. Shooter In-Game
(Personal Documentation)

The way of Airborne character movements is based on an octopus (Figure 7). It targets the player slowly and then faster when it is closer, then attacks with a laser. When it almost dies from the player’s attack, the Airborne character speeds up chasing the player and blows itself up (Figure 8). Its extra legs or tentacles can help speed up its movements by expanding and squishing them to move faster.

The running and walking cycle of Airborne is very similar, only when it’s running, it squeezes deeper. For the attack cycle, it also uses the same movement with a bit of modification. The modification consists of anticipation and arc.

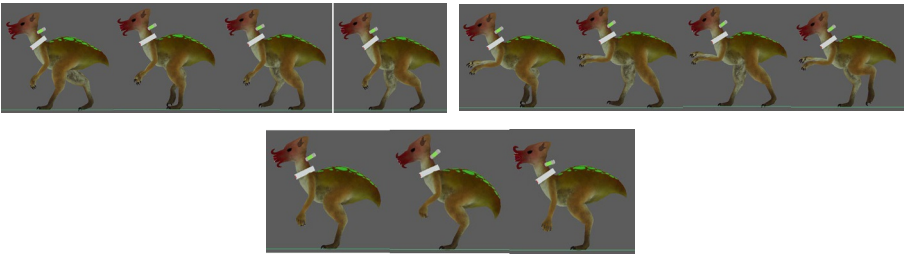


Fig. 9. Ostrich Walk (upper left), Run (upper right), and Attack Cycle (below)
(Personal Documentation)



Fig. 10. Shooter In-Game
(Personal Documentation)

For Shooter character, the anatomy is inspired by an ostrich to be bigger than the player and chase the player fast (Figure 9). Ostrich has a big middle part around its chest and stomach but has slim legs to support its middle anatomy. Apparently, this anatomy helps it to move ostrich to move high-speed movement. Replacing ostrich's wings, even though it isn't used for flying, Shooter has short arms like a Tyrannosaurus or T-Rex. Shooters shoot laser bullets from their mouth while chasing the player (Figure 10). The goal of Shooter character is to give a certain intimidation to its size and speed, as the player's last wave of monsters to fight so they win the game.

5 CONCLUSION

From the analysis of Melee, Tanker, Airborne and Shooter, airborne creature animations in the forms of walk, run, and attack cycles during the alpha tester stage, it can be concluded that the varying body proportions of different creatures can play an important role in determining how those creatures move. As stated by several researchers from various journal sources stated the body proportions of cats, gorillas, octopus, squids, and humans each serve different purposes, and almost all fantasy creatures can be described as a combination of several living beings found in the real world.

Furthermore, observation and reference to various types of animals taken as samples greatly assist in the process of creating fantasy creature animations, as fantasy creatures are often formed by combining various animals from the real world. References are crucial because they help animators visualize how the creature would walk, run, and attack in ways consistent with the movements of the animals used as references, making them appear more lifelike. These references can be in the form of footage or images, which serve as guides for animating more detailed movements.

This research demonstrates that creating believable and engaging fantasy creature animations requires a combination of solid animation principles, biological references, and a deep understanding of animal anatomy and behavior. By basing each monster in *Guns and Monsters* on real-life animals—such as cats, gorillas, squids, and ostriches—and combining their unique traits, the resulting creatures not only appear more lifelike but also move in a way that feels logical within the game’s fantasy setting.

The study highlights that different body proportions and movement mechanics significantly affect how each creature behaves in gameplay. Careful observation, reference footage, and iterative experimentation were essential to successfully adapting real-world motions into fantasy designs. Each monster type—Melee, Tanker, Airborne, and Shooter—was crafted with distinct movement styles and attack patterns to create varied gameplay challenges, maintaining player engagement across multiple waves.

Ultimately, this approach proves that blending imaginative creature design with authentic movement references can enhance immersion, improve visual storytelling, and provide a richer gaming experience. It reinforces the importance of research-driven animation in bridging fantasy and realism, enabling players to connect more deeply with the fictional world. Possible future research or studies can continue this study and focus on implementing the 12 principles of animation of the combination of fantasy creature that combines 2-4 different living beings and the anatomy differences and combinations of land, air, water types of fantasy creatures, and how to animate it.

This study contributes to the field of animation and game design by demonstrating a structured approach to translating real-world animal movement into fantasy character animation. Unlike purely intuitive animation processes, this research integrates biological observation with animation theory, supported by defined evaluation criteria. This approach provides a replicable method for animators and game designers seeking to create more believable and functionally effective fantasy creatures.

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