

# Analysis of the Technology and Production of 3D Animation Action Setting

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**Abstract:** Both human body and animation have certain lines. The human body will show various lines when walking, sitting, and running in daily life. But it is all an expression of the principle of expressive weight balance. It is necessary to outline the human body with lines in one sentence, and the animation effect should be given priority. From this sentence, we know that the action setting and the personalized display is particularly important. At the same time, different amplitude, same amplitude, different time, different quality, same amplitude and same time are all the characteristics of a character. In the process of three-dimensional animation, the twelve principles are to make the story more complete and more in line with the actual and complete deduction. This paper takes action setting, key pose, and personalized action in 3D animation as the research object, and adopts the method of combining software application with practice. First of all, the key pose is captured by shooting various action references and using scene actions. After that, the remaining keyframes are supplemented. There are two essential points in the production of keyframes. First, the lines and curves of the human body can also be called the silhouette of animation. Second, the selection and the determination of key poses are personalized action presentation. This paper gives the corresponding solutions. It is hoped that the display of key poses and personalized actions and the application of the Twelve Principles can provide valuable experience and skills for animation makers.

**Keywords:** Role action, Action set, key pose, Personalized action.

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## 1. Introduction

With the development of science and technology, 3D animation technology has gradually become new technical support in film and television animation. More and more viewers can see their charm in the advertisements for movies and TV plays. And, people who participate in the production of animation are playing a particularly important role in the industrial development of 3D animation. Attracting the audience with the most intuitive method cannot neglect action design of the characters. This article mainly talks about role action design, which is a more realistic overview of the importance of character design in a film.

Three-dimensional animation is one of the most intuitive and visually impactful expression techniques. In the process of making three-dimensional animation, most animation designers pay their attention on whether the animated film is smooth but they neglect that the premise of action design is to have a good character image first. A good character image will make the character more vital and colorful. If the whole lacks personalization and character design, the animation film will be single. In the process of making three-dimensional animation, many animation designers attach importance to skills, and they are more inclined to focus on whether the animated films are smooth or not. However, we do not pay attention to mastering the application of key pose. The key pose and character actions in action design are neglected in animation design. The animation as a whole lack personalized character expression.

China's domestic movie "Big Fish Begonia" mostly reflects the depth of field of the lens or the design of the scene from the production of the scene or the use of the lens. The three-dimensional animation lacks the prominence of the characters' movements. The movie "The Return of the Great

Sage" is made from the design of characters and martial arts action. This shows the progress of Chinese animation production. Chinese mythical heroes can also be free from their weight and gravity restrictions and attraction. Adding more imaginative actions can improve all settings for actions, personalized displays, role actions.

Image, role action, scene creation, and lens connection can better show three-dimensional animation. This film "The Monster Eating" is made by using three-dimensional animation technology. It not only shows and deducts like people but also pays more attention to reflecting one's own ideas, highlighting the personalized display and the application of key pose. In the work "Monster Eaten", the scene is a fixed scene, and the main movement is the lens and action. The characters' personalities show their works. The production of characters in the film is mainly divided into two dimensions: "static" and "dynamic".

## 2. Three-dimensional Animated Characters-"Monster Eating" as an Example

### 2.1. The Role Image Setting

This film "Monster Eating" mainly focuses on three-dimensional character animation settings. The character design of "Monster Eating" is different from the traditional image, and most of the actions made by "Monster Eating" do not happen in daily life. The realism of ordinary cartoon characters cannot reflect the setting of the characters.

This play is exaggerated and dramatic. It is mainly the bold use of exaggerated effects. It is a figure created with a skull and an image that simulates the human body. Every character in the film is perceptive, expressive, imaginative, and creative.

Perception: People with performances are very sensitive to

things around them. They have a strong sense of perception, and a strong spontaneous performance to make a certain response in time.

**Expressiveness:** Have strong expressiveness, and use body expressions and language to express certain meanings.

**Imagination:** Have a strong imagination, and be able to widely spread and excavate on the basis of something.

**Creativity:** Have certain creativity, and be able to break through personal behavior habits and make new explorations.

The main character of "Monster Eating" will react differently in different scenes. For example, the character wants to get candy by moving the box (expressively) but the box is very high and the character is afraid of falling down to react (perceptively). Therefore, the reaction is various according to different scenes.



Figure 1. Drawing from author Huang Xiaohui



Figure 2. Drawing from author Huang Xiaohui

## 2.2. Management of facial Expressions and Images

(1) The main purpose of exaggeration in action and expression is to guide the audience's eyes and make use of the characters including the lens. The lines or color blocks formed by the scene where the props are located guide the audience (the model image that the Monster Eating is a skeleton image). The dynamic line represents the state of power, the shadow under the strong light of silhouette, and highlights the dynamic line. Unless the center of gravity is weightless, it is mainly stable.

### (2) Design of expression production

Besides the pose of characters and the design of scenes in three-dimensional animation, the design of expressions is also the most important. The characters in the play are full of emotions. The emotions and sorrows of animated characters also feel the character and image of this character. The expression of a character is the reaction of the character through external factors, character, brain processing, and inner reaction. For example, happiness-happiness, happiness, laughter, bad laughter, and sinister are all expressions of happiness. Most of the initial characters also have this kind of expression. (Figure 1-3) The expression of a character when he is frightened.



Figure 3. Drawing from author Huang Xiaohui

## 3. Basis of 3D Animation Design

### 3.1. Action production of "Monster Eating"

(1) Illusion of Life: Disney Animation Design, written by Frank Thomas, a master of animation, explores the twelve rules of animation. The twelve rules of animation are squeezing, stretching, preparatory action, performance, coherent action, key action, following action, overlapping action, accelerating, slowing down, curved motion track, accessory action, time control, exaggeration, skillful hand-drawing skills and attraction. These twelve rules can determine whether the key pose can be displayed perfectly. If these twelve rules are applied perfectly, it will be smoother to set personalized actions. The production of the film "Monster Eating" is mainly based on this principle.

Here is an example:



Figure 4. Drawing from author Huang Xiaohui



Figure 5. Drawing from author Huang Xiaohui

In two photos, the hero "monster" increases his jumping ability with the help of props. Bouncing has an arc trajectory. According to the control of time, the attraction of the ground, and the accessory actions, it can achieve the desired purpose. According to the Twelve Laws, landing on the ground and bouncing high show different thoughts.



**Figure 6.** Drawing from author Huang Xiaohui Figure



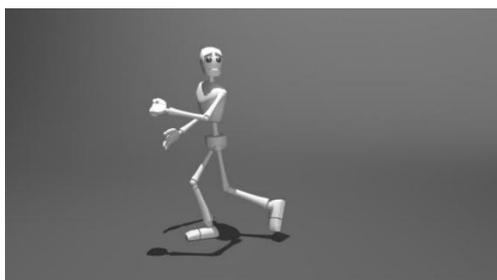
**Figure 7.** Drawing from author Huang Xiaohui

How do you understand that “monstere” who follows overlapping pictures bounce up? All superimposed actions in the air can become overlapping. The main function of overlapping is to make animated short films flow more smoothly So that the film can achieve better visual effects.

(2) Simply explain whether this personalized action is good-looking or not through the shape of the characters (the model used by monsters is in line with the proportion of characters) and the silhouette presented by the curve animation presented by the body. The curve of the human body can be divided into three types: front "C", reversed "C" and "S". Setting the action of the character under the constant normal movement is needed. In emergent situations, everyone reacts differently to things. Then, it is necessary to decide the personalized action of the characters from their personality and daily behavior habits. (Figure 8, 9) Personalized actions set in short films.



**Figure 8.** Drawing from author Huang Xiaohui



**Figure 9.** Drawing from author Huang Xiaohui

(3) Individualized role action of Monster Eating.

The key pose of 3D animation action setting. We can watch the domestic film *The Return of the Great Sage*. Whether it is the role design of production or the action design of martial arts, it is a very personalized display. Whether it is the character design itself or the setting from the storyline. It is a series of reactions that this character shows in relative situations. The consistent action method and key action method, overlapping with the action, squeezing and stretching, and time control in the film are all excellent animations. Different animators show different rhythms. In "*The Monster Eating*", each small segment reflects the different personalized actions according to the different scenes.

## 4. Three-dimensional Animation Technology Production

### 4.1. The Production Technology of "Monster Eating"

"Monster Eating" is a three-dimensional animation, which is mainly produced in three cycles. They are front, middle, and back. Pre-production mainly includes: script making, drawing split-mirror pictures, setting creative ideas for characters' actions in *Monster Eating*, and determining three-dimensional character models for simple testing; The medium-term production mainly includes making animated characters in short films so that characters and scenes can be reasonably combined; Post-production is mainly to render short films (try to shade a single frame before rendering). The beginning and the end are made by Houdini. Also, the music is made according to each scene. To make a 3D animation move, the process is extremely complicated. The animation design of "*Monster Eating*" mainly uses Maya technology, Adobe Premiere for synthesis, Photoshop, and other software production, which is divided into the following specific steps:

1. Making short film scenes: using Maya to create scenes.
2. Short film character setting: the characters drawn by the hand-drawn board in the early stage are modeled and bound by MAYA in the later stage.
3. Making short film animation: the extraction of key poses, the key poses with the extreme imbalance of the center of gravity, and the adjustment of body curves. And the polishing of the whole film.
4. Short film post-production: MAYA rendering and post-rendering synthesis.

### 4.2. Action Making in Monster Eating

We have been talking about the key pose since the beginning of the article, so what is the key pose? Let us split it up to understand. In Chinese, "key" literally means the most important part of a metaphor and the decisive factor of a situation. That "pose" is a gesture in Chinese translation. In three-dimensional animation, the role of "pose" is to complete the physical movements of characters and form a reasonable animated short film. Body movements and body language expressions are important components of pose. If the character is in weightlessness, it still has action. In the hanging air, there is still a pose. In fact, it is made up of countless poses in our daily behavior. In contrast, the visual image, character movements, personalized movements, human body curves, key pose, and the connection of lenses in the production of "*The Monster Eating*" can better reflect the characteristics of three-dimensional animation. Only the perfect combination of technology and art can present better works. Composition of two dimensions of "moving" and

"static" characters will determine whether the animation is smooth or not. In the unused scenes, "Monster Eating" reasonably uses the animation principle, and makes an emotional response to whether the exaggerated body movements are harmonious, and whether the movements are accelerated or slowed down. These are the animation features of the film "Monster Eating".

## 5. Conclusion

Three-dimensional animation is mainly about the setting of key characters' actions and their expressions. Three-dimensional animation shows characters through details, designs actions, and the scenes are simple and beautiful. The short stories are rich and meaningful, the introduction is complete, and the works are reasonable and complete. At the same time, they have story significance, and are understood

and recognized by the audience and the public. Three-dimensional animation should be completely displayed by people.

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