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The Application of Polygon Modeling Method in the Maya Persona Model Shaping

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Abstract: Computer graphics is a new industry derived from the computer technology. With the high development of science and technology, because of the accuracy and real artistic effect of three-dimensional animation, it has become a new trend of development. As a key part of three-dimensional animation, model creation has occupied an important position in the animation. To make the animated character image more plump and realistic, it has a high demand for the character model shaping. As a traditional modeling method, Maya modeling method has a unique advantage in the organism model creation. This paper systematically expounded the polygon modeling features and usability techniques of persona modeling. It aimed to make the model creation much more standardized and professionally.

Key words: Three-dimensional, Polygon, Modeling method, Computer graphics

1. INTRODUCTION

The character of three-dimensional animation is the core of animation. How to make the animated characters have much more attraction and let the audience feel authentic, thereby impress the audience and resonate with the audience but different from the real–life characters is the key of the three-dimensional animation. However, polygon modeling method is the first developed computer three-dimensional modeling technique, and is the main expression of the three-dimensional computer graphics. All of the complex three-dimensional model constructed by the other computer parameters converted into a polygon of different degrees of refinement finally, and computed to digital graphics by computer graphics software. With the development of the computer hardware and variety of utility software, polygon modeling has attracted more and more attention, especially in the area of organism model creation, and the model workers think it as the preferred shaping techniques all the time, and it has an irreplaceable position.

2. FEATURES AND IDEA OF POLYGON MODELING

In the paper below, I will introduce the whole persona’s modeling progress use the Polygon modeling method in Maya combine with the specific examples in detail.

2.1. Import the referential photo accurately

When we making the realistic 3D model, we usually need some draw character pictures as references, generally we need the character’s front and sides referential pictures, to some complex model; we also need the back referential picture. In some corresponding test pictures, we also need the back referential pictures; we use the commands of ‘View–Image’ and ‘Plane–Import Image’ to import the supplied referential pictures. If the size and other parameters of the referential pictures in the view are unmatched, we need to modify them with the software such as Photoshop, and then use the command of ‘Reset’ in Maya to reset them, then use move, scale and other tools to fine-tune so that make all the body parts in the referential pictures meet the requirement. Apart from these, something else we also need pay attention to, like we must make sure to put the center points of the character in the axis and make character symmetrical about the axis. In order to avoid the referential picture cover the axis and affect the operation, we can make pictures go some distance away from the respective coordinate plane.

2.2. Modeling the character’s head

2.2.1. Analyze of the body modeling method

There have two metrics of the pros and cons about the head modeling: the one is whether the model is accurate or not; the other is the wiring is whether reasonable or not. To the CG character model, it has an important feature to distinguish it from the sculpture is it is a dynamic picture. The animation in character’s face is very rich and colorful, many emotion and expression must be expressed by the facial animation. Like the figure 1, we must pay attention to the wiring in the drafting stage of the character.
The wiring of the head mainly concentrate on the face, eyes and mouth display a circle-like and let out outwardly. Nasolabial is a structure that can’t be ignored; both the laughing and grinning are import features. Therefore, annular of the mouth will generally extend to the nose along the nasolabial. We should also pay attention to the wiring between the nose and the eyes, because in this place, there have frown, wrinkled nose and other movement can accumulate wrinkles, we should add more lines along the direction of movement. If we should make the forehead wrinkles, we also need add more lines. This is shown as the figure 2.

**Figure 1. Structure of the Facial Muscles**

2.2. Process of head modeling

(1) Find the front side of character’s head model referential picture; (2) Create a new project in Maya; (3) Import the front side picture; (4) drafting; (5) Create a simple head model; (6) Create structure of the eye; (7) Create structure of the mouth; (8) Create structure of the ear; (9) complete the head modeling. And it is shown as the figure 3.

**Figure 2. Wiring of the Head Model**

**Figure 3. The Final Effect of the Head Modeling**

2.3. Modeling the character’s body
2.3.1. Analyze of the body modeling method

Like the figure 4, analyze the front side picture of the body and use the simple geometry to summarize the shape. It can help us to grasp the shape of the character’s body, but we must pay much attention to the body’s proportion and muscle structure.

![Figure 4. Figure of Character’s Body Muscle Structure](image)

2.3.2. Process of character’s body modeling

(1) Import the front side picture; (2) drafting; (3) Create general shape of the body; (4) delete half part of body; (5) mirroring and copy the other part; (6) extrude the leg (keep the leg’s shape during the process of squeezing); (7) extrude the arm (modify continuously to keep the arm display the shape of cylinder during the process of squeeze. Because the trend of the forearm has a rotating process, so when we modeling the forearm, we can rotate the wireframe appropriately); (8) complete the whole body general shape; (9) through the method of adding lines (add lines as many as possible in accordance with the trend of the muscle) and dragging point to modify the details. This is shown as the figure 5.

![Figure 5. Final Effect of the Body Modeling](image)

2.4. Making the hands and feet

2.4.1. Process of character’s hand modeling

(1) Establish a cube; (2) extrude the four fingers; (3) modify the node of the polygon; (4) get the general shape of the hand (pay attention to the difference of the length of the fingers); (5) add lines in the part of palm; (6) modify the model again until you feel it is a real hand. This process is shown as the figure 6.
The process of the creation of foot model is generally like the hand model, and it is expressed in the figure 7.

2.5. *Put all parts of the body together and form a whole body model*

(1) Open the body document; (2) import the head and hand document; (3) scaling, modifying the position of the head and hand; (4) put the point of joint together; (5) combine the head, hand and body together; (6) combine the point of joint together; (7) mirroring and copy the other part; (8) combine the middle edge of the body; (9) complete the whole body modeling. The final effect is shown in figure 8 and figure 9.
3. CONCLUSION

Polygon modeling involves in multiple research areas of animation making, it is foundation topics of great theoretical and practical value. Maya provides powerful polygon modeling tools that make it easier to achieve character model. If you want to create a excellent character model, you must grasp the using of every model tools well. You can only use some common commands or use the combination of the modeling methods, all in all, have a skillful foundation knowledge is crucial. Then, during the process of learning character model creation, you should facsimile the works of domestic and foreign masters, learning the features of their wiring, handing of the key parts, restore the similarity of model as high as possible. At last, you also need improve your basic skills of fine arts, including drawings, sketches and other modeling capability, and grasp the human skeleton, muscles and other related knowledge of anatomical structures.

With the development of computer science and technology, there will have much more high-level modeling techniques assimilate into the three-dimensional animation modeling continuously, this is the developing trend of three-dimensional animation character modeling technology. During the process of model creation, we should learning and practicing continuously, explore a set of modeling techniques for our own. Create distinctive role model works scientifically and efficiently.

REFERENCES