

Project reflection report with 3D animation as the direction

1 Project Planning and Implementation

1.1 Project Planning

In this project production, I plan to focus on 3D animation direction. And the work areas of 3D animation production are: 3D modeling, dynamic design, visual effects, light and shadow design, color rendering and so on.

Among them, this project challenges some animation fields which were seldom contacted or even never involved, such as special effects technology, 3D rendering technology. Especially for the 3D rendering technology part, I plan to try different picture styles, such as Japanese anime style and Chinese traditional ink painting style. Each animation is not a single presentation of a certain technique, but to create small fragments with a sense of story.

1.2 Research on 3D animation technology

The most common of 3D animation effects are generally divided into dynamics module, particles and fluids, hair, light and shadow. The most important is the dynamics module, the formation of special effects such as flames, lightning, fireworks, rain, snow, smoke, explosions, object breakage, etc., as well as simulation of some of the physical effects of reality, such as the object's free

fall, floating, collision, and such as fabric can simulate the clothes, curtains, flags and so on.

The dynamics module pursues more of a form of expression, which is the foundation of 3D animation effects. Secondly, particles and fluid, rather than saying particles are a type of 3D animation effects, it is more accurate to say particles are a way to realize the fluid means. A lot of 3D animation effects are composed of particles to form the first step, and then after a step by step production and modification to finally realize the effect of fluid, particles are the means to achieve fluid, fluid is a form of special effects. Of course, in addition to fluid, particles also play a significant role in other special effects, so it can be said that "particles" is the main means of producing 3D animation effects. "Fluid" is a synonym for the expression of liquid in special effects, including but not limited to the sea, waterfalls, lakes, streams and so on, which are all produced by fluid.

The visual impact of 3D animation particle effects is very strong, it is made by the real physics engine, such as rain, snow, clouds and fog and other situations, can make people immersed in the scene, as if it is a real occurrence. Its visual impact effect makes people shocked, randomly forming the visual art characteristics of the object. Three-dimensional particle effects in the formation of random visual performance, you can do precise random, such

as rain, snow, such as the need for random distribution of objects, through the writing of the code or particle modifier of the randomness of the rain and snow to do with the fall, reflecting the law of formal beauty of the relationship between contrast and harmony, such as the size of the contrast and harmony, the sparse and sparse contrast and harmony, directional contrast and harmony, etc., to fully simulate the real space in the rain, the snow, the rain, the snow, etc., to fully simulate the real space in the rain, the rain, the snow, etc. When it rains or snows, the size and density distribution of raindrops and snowflakes, as well as the length and density distribution of the rain line are fully simulated in real space, so that it will not make people feel very abrupt in visual performance, and form the artistic expression of the scene space and perspective of the picture. "3D Rendering 2D" mainly refers to the technique of utilizing 3D animation technology to realize 2D plane animation style, which is a kind of rendering technology born for the purpose of shaping non-realistic art style. "Three-dimensional rendering two-dimensional" technology has both the high efficiency of three-dimensional animation technology and the exaggerated expression of two-dimensional hand-drawing technology, while its animation style has both the three-dimensional animation of three-dimensional vivid characteristics, and also has the diversity of two-dimensional animation plane style.

The animated film "Deep Sea" is mainly produced with particle special effects,

which is the first time to combine the "ink", which is the soul of Chinese traditional culture, with the particle special effects technology of 3D animation, presenting the essence of the collision between traditional culture and animation technology, and making the particle ink special effects fully serve the needs of the movie's plot.

"The Deep Sea" uses countless particles to reflect the way of ink and wash expression in 3D, which is a perfect fusion of traditional oriental art and 3D production of three-dimensional presentation. Because of the fusion between particles and particles, the fusion between two colors of ink painting can be expressed more concretely. Particles can be piled up a lot in three-dimensional space, and this intermingling between them will be like the fusion of ink from all dimensions, so based on these, the choice of using particles to express ink, the combination of which is called particle ink. In this project, in addition to producing the traditional 3D rendering 2D hand-painted style, I also tried to produce the Chinese ink painting style of plum blossom production. The difference with the animated movie "Deep Sea" is that I simulated the effect of ink painting through blender's material nodes, such as adding stroke, material color gradient and so on.

1.3 Actual project implementation

In the actual animation production process, each animation clip involves

special effects techniques or three-rendering animation techniques.

In the drag racing clip, I tried to bind the car and used the constraint line to control the direction and speed of the car, so that in the dynamics more in line with the actual situation, for example, the vehicle speed is too fast, which will lead to the car tires are not enough steering, so that some inertia swaying occurs, which needs to be reflected in the animation.

The animation needs to reflect this. In the fight scene clips, I created a lot of attack effects, such as water columns, rocks, etc., mainly to emulate the two-dimensionalized effects such as lightsabers and shields that often appear in Japanese animation. Particle emission modifiers, geometry nodes and different coloring nodes were used.

For the flower and grass animation clip, I used the geometry node function of the blender software to distribute the points on the surface, then instantiate them to the points to complete the example, and then add noise nodes, color gradients, and digital nodes, which can make the flower and grass become more controllable.

I tried two different styles for the 3TOUCH technique: Japanese animation style and traditional Chinese ink painting style. The two animation clips in

Japanese animation style have fluid effects and put a stone in the water to have the effect of water flowing through it. Moreover, the coloring nodes of stroke and color gradient are added to imitate the hand-drawn effect of 2D animation. In the Chinese traditional ink painting style clip, I added geometric nodes on the basis of the first two Japanese style animation clips to simulate the effect of ink painting, and used particle modifiers to adjust the speed of falling petals in the flower petal blowing down episode.

2 Challenges faced in the project and ways to deal with them

I also encountered many problems in the project.

The first one was the animation clip of the flower growing. This part is actually my first attempt to use blender's geometry node, so at first I wasn't sure if the source position inside the "Geometry Approximation" function was normal, and if the position node was normal if it wasn't connected to the position node, it was the position of the face of the big plane. I was not sure if the source position is normal in the "Geometry Approach" function, and if it is normal to the position of the face in the big plane without the position node. Later I tried one by one, and found that the position node outputs the world coordinates or local coordinates of each vertex in the current geometry, and its output is in the form of a vector, which indicates the position of the vertex in the space, and connecting this node to other nodes, we can create animation or deformation

effects according to the position of the vertex. The geometric proximity node calculates the shortest distance, or closest point, between a vertex of a geometry and another target geometry, which means it can calculate the spatial relationship between two geometries, geometric proximity, which is generally two values as you can see in the video I'm dragging in that smaller plane, the controller, so you'll see that the geometric proximity node, which has two output values, one is the distance which indicates the closest distance from the vertex to the target geometry, and the other is the position which indicates the position of the closest point on the target geometry, so that's why in the first step, the addition of the point distribution on the face this node is actually telling the computer this vertex information for the plane.

In addition, in the animation clip of the fight, to be honest, this part of my production cycle is relatively long, including a number of attack effects, special effects can be very good to assist the expression of the storyline. However, the special effects were not as effective as I would have liked. I wanted to imitate Japanese animation to create some perfect visual effects such as lightsabers and water columns, but the attack effects I created didn't blend well with the screen, especially the water columns part, when the water columns shoot at the enemies, it's like two layers. This will destroy the viewer's sense of carrying the story.

3 Synchronization of sound and visual elements

I in order to be able to make the visual picture can be integrated with the sound effects, in the editing process on the sound track and some particle effects or action position, so that the synchronization of sound effects and the picture is accurate, especially in the instantaneous explosion of particle effects, smoke dispersion or magic release and other dynamic changes, whether the sound effects can be synchronized with the appearance of the visual changes, such as the car racing clip, some overtaking shots, the cardinal points of the production of music and sound effects. In the fight clips, the attack effect with the rhythmic drum beat of the music, and repeatedly check whether there is sound effects in advance or lagging behind the picture, and constantly reflect on the sound effects in the picture of the hierarchy, especially in the particle effects-intensive fight scenes, whether there are too many sound effects stacked up to lead to confusion. Check the balance between background sound effects, ambient sound effects and main effects sound effects to ensure clarity and layering.

In practice, I have learned the importance of checking that the sound effect style matches the hand-drawn texture of the 3-touch animation. It is important to learn to reflect on whether the sound effects are too realistic or modernized, thus not matching the cartoonish, flat style of the animation. The sound effects were adjusted to better fit the overall art style of the three-touch animation. In

addition, in the Chinese ink painting clip section, I wanted the audience to be able to feel the mood of the picture through the music. Therefore, evaluating whether the sound effects can convey the emotional intent of the picture is also an important strategy for audio-visual integration, in which the sound effects and visual effects complement each other.

4 Reflections on this project

3D special effects are not just visual decorations, but can also play a key role in storytelling. Through special effects, creators can express abstract concepts, fantastical elements or unseen forces to make the story more attractive and deeper. Different animation styles also need to be matched with different animation production techniques, but we must not forget that special effects, graphics and sound effects, are all for the final display of the animation story service, in order to accurately express the content of the plot, so that the audience can have an immersive experience. In order to purely show off the skills, forget the original intention of the production of three-dimensional animation.