Simulation of Particle Effects Based on Egret Feather

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Abstract: In the nature, there are many scene like storm, rain, snow and etc, all of which actually could be simulated by particle. Therefore particle effects could be used in a long range of ares, and its basic structure is the tiny texture to duplicate in a special way to generate many alike pieces with random parameters. In this paper, Particle effects are well studied, and finally a mess of butterflys flying the sky are demonstrated.

1. Introduction

In game design, an important phenomenon of simulating the real world is particle effect simulation, which can simulate natural scenery such as water, cloud, smoke, rain, snow, etc. some methods are realized by means of three-dimensional scene, while in two-dimensional game, a large number of prefabricated particle effects are used to simulate the real scene. In this paper, we will analyze the basic principle of particle effect, understand the relevant technology that can be used in particle effect, and use egret feather to simulate particle effect [1].

2. Particle effects

Particle effects used in games and animation, can simulate the use of simple pictures to simulate a variety of rich natural effects. Particle effect can increase the authenticity of physical effects. By adjusting the motion effect of particles, the real effects of gravity, gravity, wind and collision can be simulated [2]. In general, the particle effect is realized by the particle system, there will be emitters and a group of particles, particles have their own particle life, initial velocity, particle color and so on (see Figure 1).

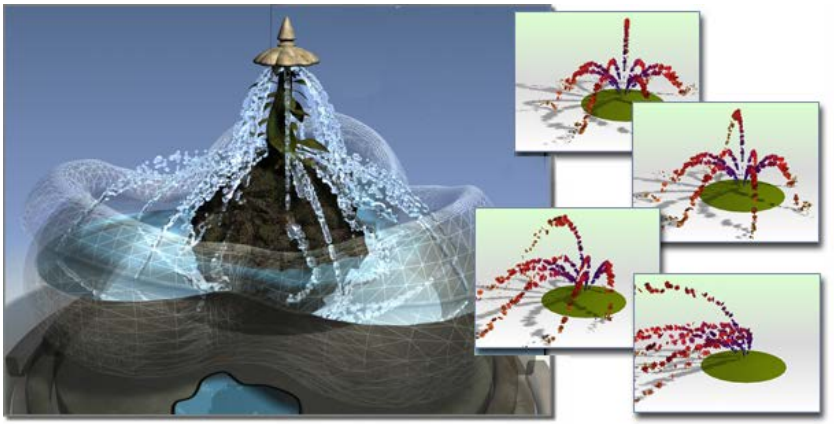

Figure 1 Particle effects

Particle effect has obvious display richness, physical authenticity and high efficiency. However, the system consumption of particle effect is large, and it often needs to be optimized to achieve the best display effect. The two-dimensional particle effect can really simulate the three-dimensional particle effect. Through certain calculation methods, it can quickly load and add incomparable effects to the characters and scenes in the game [3].

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3. Egret feather

Egret feather is a particle editor, the combination of various parameters to create a variety of effects, adding color to the game, mainly making two-dimensional particle effects. The whole process of visual editing operation, shielding all the underlying complex parameter settings. WYSIWYG mode of operation, even if there is no programming skills of art personnel can also quickly start, immediately produced exquisite particle effect. The editor can automatically export the configuration file for program development, which makes it possible to achieve ideal performance experience through batch processing when using webgl and opengl rendering (see Figure 2) [4].

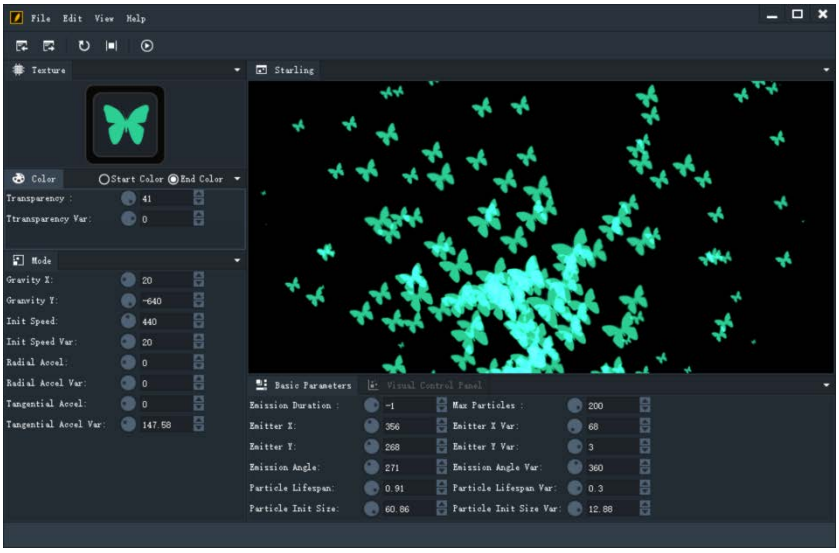

Figure 2 Feather interface

The parameters of Egret Feather particle mode are as follows:

Texture: controls the mapping of particles.

Transparency: sets the transparency of the initial and final particles

Gravity: control the gravity setting of particles to simulate the downward force of particles in the process of falling;

Init speed: initial emission speed of particles;

Rail accel: particle divergence acceleration;

Tangent accel: tangent divergence velocity;

4. Simulation

We're going to demonstrate the particle effect of a butterfly flying. Hundreds of butterflies will be launched to form a picture of competing flies.

Step 1: Make the corresponding image of a single butterfly as a texture map.

Set the image as transparent background, the size is 256*256 pixels, the resolution is 72 ppi, and the storage format is PNG (see Figure 3).

Figure 3 Butterfly texture

Step 2: Import the map, set the transparency in the initial parameters, and increase the

superposition effect of butterflies flying together (see Figure 4).

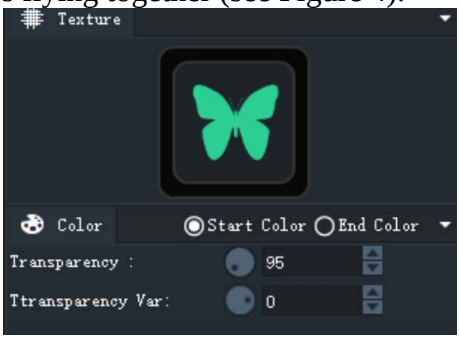

Figure 4 Texture and color

Step 3: Set the basic parameters of particle emission, the following parameters are as follows.
Emission duration: if it is set to - 1, it will emit all the time, and will not stop transmitting.
Emitter XY: coordinate point of emitter.
Emitter angle: the angle of the emitter.
Particle lifespan: particle life cycle.

Particle init size: initial particle size.
XX var: the change range of each parameter (see Figure 5).

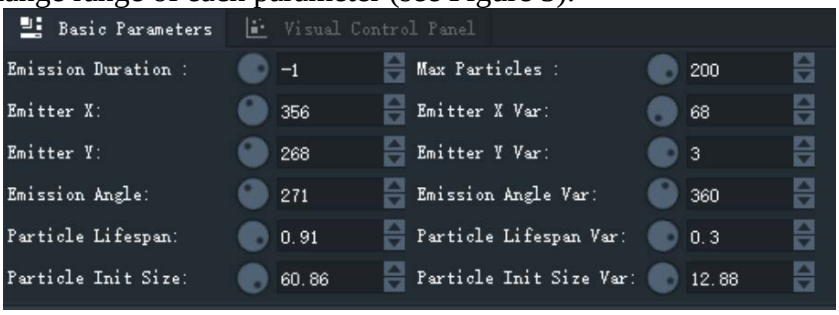

Figure 5 Basic Parameters

Step 4: After setting, check the final effect (see Figure 6).

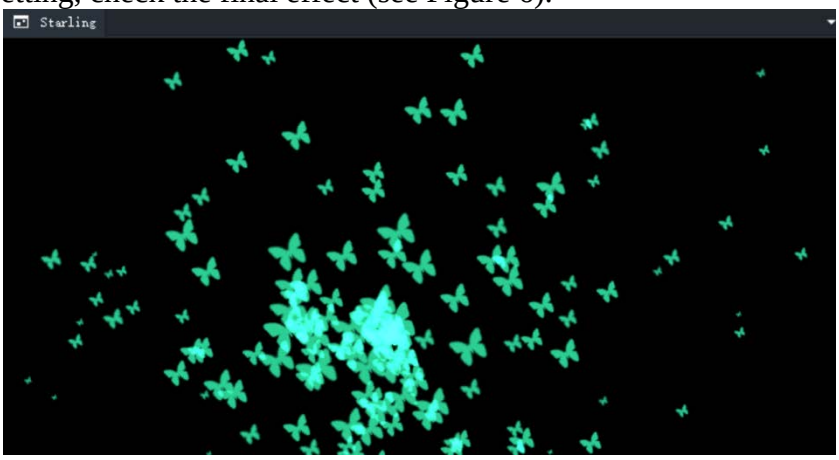

Figure 6 Final Effects

Step 5: export the configuration file and texture file of particle effect, as shown in the figure below (see Figure 7).

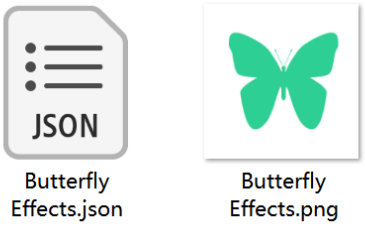

Figure 7 Configuration and texture

Step 6: View the configuration file, JSON format, for other software calls later (see Figure 8).


```
{
"texture":"Butterfly Effects.png",
"maxParticles":200
,"radialAccelerationVariance":0
,"duration":-1
,"endRedVariance":0
,"tangentialAcceleration":0
,"blendFactorDestination":"oneMinusSourceAlpha"
,"startBlue":255
,"maxRadius":100
,"blendFactorSource":"one"
,"maxRadiusVariance":30
,"lifespan":910
,"emitter":{"x":324,"y":264}
,"minRadius":20
,"endRed":255
,"minRadiusVariance":10
,"startSize":40.71
,"rotatePerSecond":30
,"startSizeVariance":12.88
,"tangentialAccelerationVariance":147.58
,"rotatePerSecondVariance":10
,"endSize":5
,"emitterVariance":{"x":68,"y":3}
,"engGreenVariance":0
,"emitterType":0
,"startGreenVariance":0
,"emitAngle":271
,"lifespanVariance":300
,"emitAngleVariance":360
,"startAlphaVariance":0
,"endAlpha":0.1607843137254902
,"startRed":255
,"startGreen":255
,"startRotationVariance":0
,"endRotation":-30
,"endGreen":255
,"startRotation":-30
,"endRotationVariance":0
,"startRedVariance":0
,"speed":440
,"startBlueVariance":0
,"gravity":{"x":20,"y":-640}
,"speedVariance":20
,"startAlpha":0.37254901960784315
,"endSizeVariance":5
,"endBlue":255
,"endBlueVariance":0
,"endAlphaVariance":0
,"radialAcceleration":0
}
```


Figure 8 Configuration json

5. Conclusion

Particle effects represent the natural effects with particle characteristics in the real natural world, especially the use of two-dimensional particle effects in computer simulation scenes. In this paper, egret feather is used to make the special effect of two-dimensional particle butterfly flying, which shows the universality of particle effect. The effect document can be used in other software that needs particle effect.

References

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