Application of ActionScript3 language algorithm in animation image design

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Abstract

Animation became increasingly popular with the rapid development of creative culture in recent years, thereby earning increased attention and emphasis in the process. Images enter people's consciousness because of new technologies and different situations. Scholars have studied its application in animation image-making and design with ActionScript3 language algorithm routine theory under Flash. Relevant mathematical calculations are used for language code design. The function of ActionScript3 language is interpreted from five perspectives, namely, graph and image, text field, grain effect, transition effect, and 3D effect of animation film and television. Feasible language algorithms are designed to achieve vividness, exaggeration, and art. Research lays the foundation for further studies on ActionScript3 language algorithm and is beneficial for the development of image animation industry.

Keywords: ActionScript3 language algorithm; animation image; special effect design

1 Introduction

Animation is a category in the creative cultural industry. As a kind of media transmission of mass information, animation complies with development needs of society and increasingly becomes a trend for people's consumption. It completely uses image-flow language to convey information and converts relatively abstract contents into pictures with the inclusion of explicit entertainment and certain visual enjoyment. It effectively shortens the distance between vision and character, thereby increasing its popularity further. Animation image is different from traditional arts. In animation, all roles and scenes are displayed through transformation, exaggeration, and other methods. Based on aesthetics, animation effectively combines the application of film narrative, various skills, music insertion, and other comprehensive visual and auditory arts. Given the deepening and popularization of electronic computer technology and the rapid development of high and new technology, people began to increase their requirement for animation images. As a result, numerous creation tools emerge endlessly. Flash is a professional animation design tool developed by Macromedia. Since its development, it has been mainly used to design vector animations. Based on the appearance of ActionScript language algorithm of Flash, it brings forth a complicated animation influence design era with relatively strong functions. ActionScript developed from 1.0 to 3.0. ActionScript3 can properly control animation image flows, and exhibits enhanced performance in terms of listing and drawing.

ActionScript3 is one of the language algorithms of Flash. It exhibits strong data processing capacity and interactive function. In addition, it can realize interactive content-to-content and user-to-content connections. Common applications of ActionScript3 combine Flash creative tools. This algorithm can be used to design animation special effects in different styles, thus making such effects more colorful, more humanized, and more flexible than before. ActionScript3 consists of kernel language and Flash Player API. Kernel language refers to the structure for program language design, and is used to establish control program structure and object data. Flash Player API can realize specific functions and is composed of a series of Flash players. ActionScript3 is an object-oriented programming language with standard quality. Code (i.e., programming) is mainly used for function setting; when ActionScript3 language is used for animation design, objects should be able to receive information, timely process information, and effectively feedback- and output-processed information. In achieving relevant objectives, applying category, object control data, and derivation of inheritance realization function is necessary.

In terms of the application, researchers of ActionScript3 language algorithm in animation image design obtained several achievements. For instance, Chen Jing [1] studied how to use ActionScript3 language algorithm to produce electronic greeting card software that is smaller, simpler, and more suitable for non-specialized persons compared to those currently available in the market. Hu Qiguang and Wu Ronghui [2] formulated the animation programming theory of

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ActionScript3 and realized animation methods through Event.ENTER FRAME event and TimerEvent.TIMER event. They also applied physical and mathematical knowledge in establishing an object motion model and designed codes to realize animation design. Qi Binghui and Liu Qiaoli [3] described the technology of using ActionScript3 scripting language for Flash programming creation from the perspective of visual display framework and object-oriented design idea. In addition, Luo Yan [4] studied animation production with ActionScript3 language for scene and game roles, and analyzed and solved issues existing in game development.

For independent research, most studies select only one aspect from the whole system. Review of literature shows that no systematic research is currently available. In addition, most studies focus on introduction to theory and lack systematic and practical analysis. Based on such research, the author uses ActionScript3 language algorithm and establishes the programming algorithm with the influence of animation on design as an example. Moreover, the author also conducts case verification analysis, thereby providing reference value and theoretical support for the development of animation image. This approach is useful to gain a deeper understanding and further development of ActionScript.

2 Application of ActionScript3 language algorithm in animation image design

On the basis of ActionScript3 language algorithm, an analysis is made onto its application in influence of animation on design. According to the analysis result, ActionScript3 language algorithm can effectively accomplish relatively complicated animation effects, simplify labor of traditional patterns, improve the efficiency of animation image production and enrich the effect of animation pictures.

2.1 STRUCTURAL DESIGN ON ANIMATION IMAGE

Generally, an animation image is designed with ActionScript3 language algorithm on the basis of Flash animation technology. At the same time, it can be realized by virtue of the third party image, voice frequency and other processing software. Basic structure of the whole animation image is shown in Figure. 1. It is known that animation production consists five parts. Specific works of each part are listed as follows:

(1) Image processing: digitize image materials, use Photoshop and other software to process those image materials, and provide some materials for the whole animation image production;

(2) Audio clip and processing: collect, edit and clip necessary music and figure dubbing, use some professional software for noise reduction and processing of special effects;

(3) Animation subject production: design with Flash through shade, guide, frame and other modes, and finish animation sections;
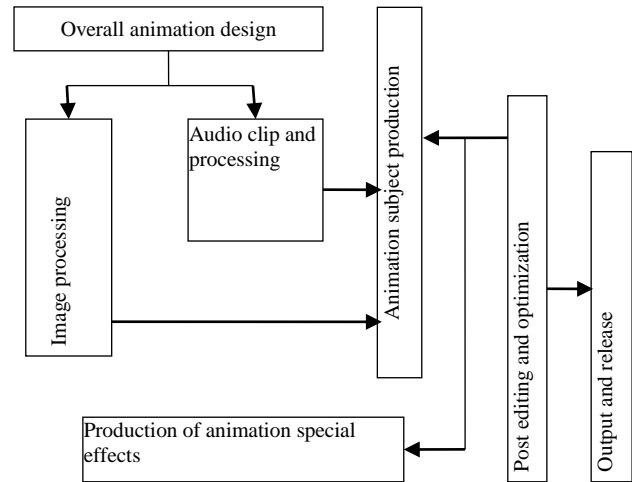

FIGURE 1 Framework of Animation Image Production

(4) Production of animation special effects: use ActionScript3 language algorithm for special effects of the real part, enrich and art up the whole animation images; main animation flows are shown in Figure 2:
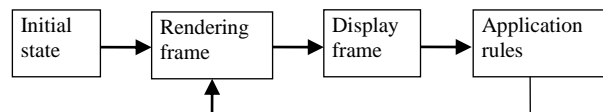

FIGURE 2 Flow of AS3 Animation

(5) Post editing and optimization: properly composite and process the degree of animation, set subtitles, number of episodes and others, and finish output and release of animation images.

2.2 APPLICATION OF ACTION SCRIPT3 LANGUAGE ALGORITHM IN ANIMATION IMAGE DESIGN

It can be seen from above animation image design process that ActionScript3 language algorithm is mainly applied in the fourth part: production of animation special effects. It can realize special effects that cannot be realized or it is relatively difficult to be realized by common key frames. ActionScript3 language algorithm is beneficial for more beauty and enrichment of animation effects.

2.2.1 Use ActionScript3 language algorithm for processing of graphic images

The latest version of ActionScript3 can be used to process vector diagrams and bitmap images. It can be mainly divided into two categories: Bitmap objects and

BitmapData objects. Bitmap objects can make images to be timely display on the screen. BitmapData objects are used for visit and operation of original image data. ActionScript3 can be used to alter the pixel of images, so as to achieve the effect of filter. Moreover, ActionScript3 can set random noise and texture. With the phenomenon of cloud drifting in animation image as an example, specific descriptions are made.

During programming of ActionScript3 algorithm, perlinNoise can be used to produce similar life-like texture. This method can properly process smoke, explosion, cloud and other animation special effects.

Create a new file, set its attribute as default of the system, then compile the effect of cloud drifting in the animation editor; relevant program language is shown as follows:

```
Import flash display Bitmap;
Import flash display Bitmap Data;
Var my Bitmap Data Object: Bitmap Data= new Bitmap Data
(1000, 1000, false, 0x00FF0000);
Category of // BitmapData includes built-in method. It can be
used to create and process pixel data, including parameter
setting of width, height, transparent and fill Color (for specified
background color).
Var seed:Number=Math.floor(Math.random()*100);
// This parameter decides changes in the number of random
seeds of cloud patterns.
Var channels:uint=Bitmap Data Channel.RED|Bitmap
```

```
Data Channel.BLUE;
// This parameter specifies that the pattern of cloud texture is
Red and Blue among four fours (ARGB).
My Bitmap Data Object. perlinNoise(100,80,6,seed,false,true,
hannels,false,null);
// Set the size of pattern of cloud drifting (directions of x and y),
num Octaves and other parameters.
Var my Bitmap:Bitmap=new Bitmap(my Bitmap Data Object);
My Bitmap.x=-450;
My Bitmap.y=-550;
Add Child(my Bitmap);
// Display created cloud texture pattern on the screen, it needs to
distribute this object to Bitmap case and utilize add Child()
Method to add it to the display list
Add Event Listener (Event. ENTER_FRAME, scroll Bitmap);
// The application of Scroll() method can copy cloud patterns on
the screen and paste to new deviation position appointed by
parameter.
Coordinate Enter Frame event detectaphone for application;
cloud texture will be dynamic. Thus, it presents the effect
similar to drifting.
function scroll Bitmap(event: Event): void
{my Bitmap Data Object. scroll(1, 1); }
```

In the process of special effect processing of cloud drifting, it is usually impossible to achieve the effect with tween animation. It needs to realize lifelike scenes through encoding program design.

2.2.2 Use ActionScript3 language algorithm for processing of film and television texts

When ActionScript3 language is used for processing of breaking animation film and television texts, TextField category language can be used for realization. Verbal contents should be preset in the editor. Create text field, set different attributes (such as color and size of text font) according to specific needs, and set static / dynamic format; then, program descriptions are made with the filter special effect of text field "the Spirited Away" as an example:

```
import flash.display.Sprite;
import flash.filters.Drop Shadow Filter;
var my Text:Text Field=new Text Field();
My Text.text = "musicians in Ningbo"
My Text.width=300;
My Text.x=120;
var format1:Text Format=new Text Format();
format1.color=0xFF0000;
format1.font= "bold"
format1.size=50;
format1.bold=true;
format1.italic=false;
My Text.set Text Format(format1);
// above code is parameter setting of essential attribute of text.
var shadow: Drop Shadow Filter=new Drop Shadow Filter();
// setting of shadow filter effect
shadow.distance=5;
// distance of shallow light
shadow.angle=45
// projection angle of shallow
My Text.filters=[shadow];
Add Child(my Text);
```

Projection filter can effectively achieve the effect of display independent light sources around the font and adjust final effect in practical processing by setting of relevant parameters and definition of intensity and different positions of light.

2.2.3 Use ActionScript3 language algorithm for design of particle effects

When particle effects appear in animation images (for instance, a person dreams of lots of money scattering in an image), ordinary animation processing is of relatively complicated process and tedious processing. Besides, obtained pictures are comparatively stiff, without exaggerated expression. At the moment, ActionScript3 language algorithm can be used for realization. The basic thought of design is shown as follows: based on a piece of money, obtain lots of money through copy, set coordinates of money and achieve the special effect of money scattering like snowflake flowing.

Main programming process is shown as follows: create film cutting of a money image at the background level of animation section, edit in the EditBar, return to the main scene, edit and put money into the scene,

suppose its name as "coin", select money film cutting, and then use the algorithm to compile language in the action panel.

According to ActionScript3 language algorithm above, the effect of money scattering can be simply realized by setting the size, speed and position of money falling.

2.2.4 Use ActionScript3 language algorithm for design of animation transition effects

In the post editing and processing process of films, transition can be also realized. The effect of fade-out or fade-in can be achieved through simple processing. However, ActionScript3 language can be used to make picture and its transition more natural and form of transition more diversified, such as processing of curtain sliding and water wave. Then, research and analysis are made with the effect of shade as an example:

Main realization steps are shown as follows: create a square film cutting mcRec with its side as 50, set registration point as the center, import n relevant graphs, name as pic1, pic2, pic3,··· , save in the form of film cutting, and then create ActionScript level and compile language:

Under the circumstance that this code has no shade with large background, the function is used to repeatedly increase the length of side till the shade can cover Beijing and achieve the objective of transition. Its effect gradually develops from the center to edges.

2.2.5 Use ActionScript3 language algorithm for design of 3D animation effects

Basically, all original films and televisions are two-dimensional. Their pictures have no 3D effect, lacking visibility at the same time. With the development of science and technology and the progress of 3D technology, people increasingly pursue for 3D vision while watching animation, film and television. In the design of animation, film and television, however, the application of ActionScript3 language algorithm is one of effective approaches to realize 3D effects. 3D effects are realized by ActionScript3 on the basis of 2D planes. In essence, its objects are two-dimensional. Calculations of mathematical models are mainly used to project 3D of objects onto 2D planes, so as to simulate 3D effects. While using two-dimensional coordinate system, Axis X is moved to the right side and its value is increased. At the same time, Axis Y is moved down and its value is increased. According to this principle, objects on Axis Z will have greater values with longer distance from the point of sight. Fig. 3 shows the 3D coordinate system under the environment of ActionScript3.
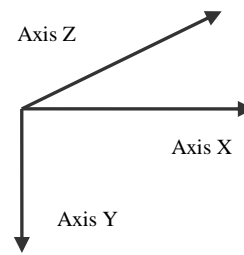

FIGURE 3 3D Coordinate System of ActionScript

According to different animations, films and televisions, brief process of 3D simulation is shown as follows: the basic thought is that: simulate 3D effect of rotating around Axis Y, create a new file, supposed to import 5 graphs, create film cutting, set pictures as the first level and encoding language as the second level, put pictures into 5 frames according to the sequence of pictures needed, and then return to the main scene, import background picture into the first level, and write the following language into the second level.

After editing, code is subject to mathematical calculation through trigonometric function. Moreover, its effect is tested, thus obtaining the plane of the object rotating clockwise around Axis Y and vertical to X and Y.

3 Conclusions and recommendations

3.1 CONCLUSIONS

ActionScript3 language algorithm can be used to obtain effective application in animation image. Moreover, it overcomes numerous obstacles in the original animation design. Besides, ActionScript3 language algorithm can allow users to analyze and observe the whole process of order execution and convert abstract contents into specific ones. It is epically important in processing of image special effects and production of animation special effects. Effects designed by ActionScript3 language algorithm are more vivid and beautiful.

ActionScript3 language algorithm is simpler in operation and process, shorter in processing time against other methods. With rapid development of science and technology, further improvement will be made to ActionScript3 language algorithm. Thus, it is of vast potential for future development.

3.2 RECOMMENDATIONS

Due to limited resources in animation image design and production, it may result in deviation. However, ActionScript3 language algorithm can be selectively used according to specific needs. In the process of design, attention should be paid to setting of different functions. Different effects can be processed through effective verification. Technology is served as the primary productive force. It needs attention of supports of both the nation and people from all walks of life as well as

consciousness of reform and innovation. Moreover, it needs to strengthen the development of ActionScript. It should be popularized in the animation image industry, so as to make it to be applied into a wider range.

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