

Summary of Computer Processing and Editing Technology for 2D Animation

Li Shuangwu

Animation Institute, Hebei Institute of Fine Art, Shijiazhuang, 050700, China

Keywords: 2D animation; processing and editing software; 3D animation; Gif; Flash

Abstract. In multimedia projects, it is not enough to describe the process of the process, it is not enough to rely on the information of the text or graphic image. Animation can be more intuitive, more field to show the changes in the process of things. Animation than the static picture of the expression of information, less storage space than the video. Compared with the video, the requirements of the processor is relatively low, but also through the simulation of the method can not be recorded in the video recording process, such as the movement of electrons or planets. Therefore, computer animation has a very important role in the use of multimedia courseware in the rational use of animation, can greatly enhance the effectiveness of teaching.

Introduction about 2D Animation

Animation Development History and the Principle of Animation. A lot of people in childhood had flip book: each piece of paper draw a villain, action of each are not identical, when quick flip, feeling screen villain to move, this is animation of the original form. 20 years of the 20th century to the end of the 1930s end, when the father of the commercial animation film Disney will then "animation" new things that developed into a art, animation began to have many authors and audience, million Disney cartoons and our country animation originator's three brothers "havoc in heaven" and other works can be said is known. These works using traditional animation method, namely each picture are actually by animators in the two-dimensional plane by hand drawing and. So why is the static image can give people the feeling of dynamic?

Animation and film and television are the same as a technology and produced by the characteristics of human visual persistence. The so-called visual persistence, is refers to the people's eyes in more than 24 / s picture playback speed can not be distinguished. Each individual static images. Higher speed will make the action look smoother and more continuous. When the speed is slow, the picture will have a beat or flicker. Animation is to play a series of static images quickly, so that people have a dynamic effect on the visual. Composition of animation per a static picture called "frame", animation playback speed is often referred to as a "frame rate", expressed in per second play frames, denoted by F / S. [1]

The early animation works made by hand painted, the production process is complex, the production cycle is long, the expression is very limited. Computer graphics technology emerged organically high-tech and artistic creation, the 2D computer animation production system (such as the animator animation production system), using computer processing characteristics, the large number of repetitive labor by a computer to do, greatly reduces the complexity of the production process, improve the animation production efficiency. In the two-dimensional animation production system has also increased the number of animation and animation effects, and some results are not complete by hand drawing. But it is difficult to show the real life of people and things, not to say the imaginary world of the artist's imagination. With the improvement of computer technology, computer three-dimensional animation production system came into being. Three dimensional animation system perfectly will computer technology and art combine, not only for the artists provides unprecedented creation tools, and thoroughly to extricate them from brushes, canvas. Artists only need to use a variety of tools available on the computer to make their own creativity and imagination.

Animation Type. There are two ways you can choose to use animation in a multimedia project. One is to use a special animation software to generate independent animation files. The animation files can be embedded into a multimedia project, and can also be used to control the playback of the program. Animation produced by the use of animation software frame based animation, animation based on the role of animation and object based animation. The other is to use the multimedia creation tool to provide the animation function, the production of simple object animation. For example, you can make an object on the screen (can be a picture, can also be a line of text) moving along the specified trajectory, resulting in a simple animation effects. According to this idea, the animation can be summarized into 3 types: frame based animation, character based animation, object animation.

Animation based frame; frame based animation works very much like the previous mentioned flip book, when the fast playback of all the pictures, it will produce a dynamic feeling of running. Initially, people in the computer to imitate the original animation technology, you need to manually draw each frame image, the production efficiency is very low. Now, with the rapid development of computer technology, the use of advanced animation software, you can cut, copy, paste and other ways to reduce duplication of labor, improve the speed and quality of animation production. In addition, the editing of each frame is much more relaxed than before.

Animation based role, which is based on the role of the animation is based on the frame of the animation technology evolved, the purpose is to improve the speed of animation production. The name comes from a hierarchical technique, an animation technique that is superimposed on a static background. By using this technique, the animation maker does not need to re draw all the elements of each frame in the animation. For example, in a scene in the animation, the background only needs to be generated once, and then by moving objects in the foreground to produce animation. [2]And frame based animation, in the role of animation, but also pay attention to the performance of the prospect of action. Each movement and posture must be subdivided into basic components, and then carefully draw down. Obviously, using a public static background can improve the efficiency of the process.

On the computer, because a lot of work is done by the computer automatically, based on the role of the animation is more efficient. For example, you can use the copy command to copy a screen element, and then a little distortion, resulting in the middle of the animation frame. In the animation software, for an element, usually draw 2 to 3 basic motion modeling, the use of the function of the software itself can produce the other frames needed to produce the entire action. For a bird to fly across the screen animation, can draw two different positions of wings of birds, are birds flying across the screen, the path, the animation software can automatically in a given path inserted in the middle of the frame, the bird really looks like a fly.

Animation object in multimedia production can be regarded as the most basic and most effective animation technology. Flash animation is a typical object based animation. In the production of flash animation, objects are the basic components, the Drawing toolbar drawing tools used in frame editing area to draw a vector based objects, in order to facilitate object reuse can to object to save for the component or directly create a component; object in the scene, the static images of a scene said frame, each scene can is provided with a plurality of layers, each layer has a number of objects that change at different time (i.e. different frame in object position and shape of the resulting animation. Current popular with many multimedia authoring tools have object animation function, and based on the frame of the animation and based on the animated characters different, it is not necessary to make independent animation files in advance, then embed or reference, but the direct use of multimedia authoring tools built in animation function, through the operation of the specified object animation produced. Object animation is usually shown as a constant object moving along a certain trajectory, in the process of moving, you can make the object rotation or change the size, and even make the object deformation. For example, in the specified number of frames within the circle can be specified according to ellipse path transformation. Object animation can increase the performance of the project itself and the appeal, but also some of the dynamic effects of the production is not difficult. For example, you can present a picture in the middle of the screen, the

picture is moved to the edge of the screen, and then show the next picture. In fact, a lot of excellent multimedia projects are using object animation to the fascinating.

Now, it is also a kind of deformation animation technology, in television, movies, we have repeatedly seen the deformation of special effects. Deformation animation refers to the effect of a change, on the face of it, on the screen of a thing very naturally into also a kind of thing, can be in a geometric shape into another shape can also be a dog into a cat.

Animation Production Process. Computer animation is developed on the basis of traditional hand animation, and their production process has many similarities. Manual animation production process is: write scripts or lens script, drawing the key picture, drawing sketches on paper turn painted film, colouring, editor. [3]Using computer animation manufacture software manufacture animation main process is: written script, drawing the key frames (including coloring) generation, intermediate frames (using animation software automatically generated), animation files, edit (several animation synthesis file).

Animation File Format. Common animation formats are FLI, FLC, AVI, SWF, etc.. FLI format is developed by Autodesk company belonging to the lower resolution of the file format, with a fixed screen size (320 mm x 200 mm) and color resolution of 256 colors. Since the screen size is about 1/4 of the full screen, the computer can also be played with a resolution of 320 mm x 200 mm or 640 mm x 400 mm. FLC format is also developed by Autodesk, which belongs to a higher resolution file format. FLC format to improve the FLI format with a fixed size and color resolution is low, is a variety of screen size and color resolution of the animation format, can be adapted to the needs of a variety of animation.

2D Computer Animation. Motion is the essence of animation, animation is the art of motion. 2D computer animation (2D computer animation is with the aid of computer animation. It mainly shows that 2D content such as used to simulate the operation of all kinds of experiment process and experiment instrument etc., but also can be produced through special processing 3D effect. The current computer animation processing, two-dimensional animation with its simple and convenient production and use has been the majority of animation design and production staff of all of the favor. Especially in the production of multimedia courseware, due to the low cost, low cost and low requirement for the production and operation of the hardware environment, a large number of applications have been obtained. The basic principles of two-dimensional computer animation and traditional animation have many similarities, but there is a great difference in the production technology. In the overall design of two-dimensional animation to the specific production process should pay attention to the following aspects.

The Rational Design of Two-dimensional Animation. 2D animation action and the pace of change is determined according to the teaching content, animation size and the total number of frames is determined according to the call of 2D animation courseware application hardware environment, the two and the animation image complexity together constitute the animation data elements. When the amount of animation data is large, in the high performance of the hardware environment to play in order to get a smoother animation effect, otherwise the animation will have a sense of pause. Usually in order to ensure the effectiveness of teaching, always to ensure that the animation of complex degree as the premise, properly adjust animation size and the total number of frames to reduce broadcast on the dependence of the hardware environment, in order to obtain better animation effects.

To Ensure the Authenticity of the Simulation Results. Due to the two-dimensional animation commonly used on the teaching content of shoot in the field was simulated, and from two-dimensional animation of the shape, color, rhythm and ensure the effect of authenticity. According to the teaching effect, we need to exaggerate some phenomena, then we should design the reference object in the animation, or use other media in the courseware to explain, easy to understand.

To Improve the Production Efficiency of Two-dimensional Animation. Usually the production cycle is longer, should make full use of a variety of tools to make the software function, improve the efficiency of animation production. For example, the main basis of the image of the screen can

be input by the scanner; analysis and search for the law of motion of the animation frame, in order to avoid a large number of repeated production and ensure consistency, etc.. In the production of two-dimensional animation, often the same kind of effect can have a variety of different methods to produce, should choose the method of high efficiency, which needs to be in a lot of production practice to obtain its law.

2D Animation Editing Software. Commonly used 2D animation software has several below: AnimatorPro Animator, Windows under the Studio Director, DOS, Flash, etc.. The 2D animation editing software Flash is widely used because of its simple, easy to learn and quick effect. Flash source file format for fla, after the release of the film file format swf. In addition, there is a kind of Gif animation is also commonly used in the production of courseware animation effects; commonly used voice editing software Forge Wavelab, Sound, CoolEdit, etc.. [4] Using the windows operating system's own recording attachment machine for audio input and in a flash can also sound simple processing, such as making the sound fades, interception of a audio, although the function is limited, but for making teaching with courseware is enough.

Basic Steps To Make 2D Animation. The basic steps of making 2D animation are: using computer to produce and edit key frame; calculating and generating intermediate frame; defining and displaying motion path; interactive painting; producing some special effect.

1 key frame system; as in traditional animation, painted by artist, key picture, by artists use key picture painted in the center of the picture, finally one by one these pictures pictures animated film formation, the process is very complicated and cumbersome. Now in the computer aided animation design, the key frame can use input devices, such as scanners, digital devices, such as digital input, but also can be directly drawn and edited in 2D animation software.

2 coloring; draw good graphics using computer graphics, image processing software or animation software for coloring, these software can provide the color palette, brush and other functions, the use of simple, convenient and intuitive.

3 layered production and synthesis; the processing of graphics in the animation software for synthesis, and the definition of the appropriate path for the object, the final use of the layer to separate processing, the merger generated a video file.

Commonly Used 2D Animation.1 Gif animation; in a large number of image formats, Gif is a very special format, which is the most popular Internet image format. In addition, GIF file can make key frame animation, namely the animation for each frame to deal with, making use of GIF animation files software, such as Adobe Image Ready, these static picture even together, set the time interval, play can be. Gif animation production is simple, and the amount of information is small, fast spread in the network, in the courseware making these advantages also very applicable.

2 flash animation, flash is typical of 2D animation production software, and because it generates the movie file has the advantages of small size, and to support the streaming media technology, so the network is very popular, in the production of courseware in the process also reflects the strong advantage. Flash is simple to use, and its production process is as follows: rendering graphics or import external bitmap; for graphics to add color and hierarchical processing; key frame, and the production of intermediate animation, such as shape complement occasionally motion compensation such as; used some small cartoon fault produced can be repeated with the MovieClip; import audio files, and the flash of the properties panel appropriate treatment; release films were tested.

Whether it is two-dimensional or three-dimensional animation, animation, whether the form of animation, are to be used for the application and services. [5]So in the use of computer animation, especially used in the courseware should pay attention to: 2D animation should be after the teaching analysis (determining factors to the teaching content of two-dimensional animation), animation design (to determine the two-dimensional animation picture, action, the rate and rhythm) and animation steps.

Introduction about Making Animation in FLASH

FLASH has three layers meaning: (1) The English meaning of FLASH for photography is an instant, transient. (2) It is relatively popular in the computer animation software of design and manufacture; (3) It represents the popular creation made with the software in the Internet, television. Flash is a kind of interactive multimedia technology, his predecessor is Future plash, early popular online plug-in for making vector animation. Now there have been hundreds of thousands of online Flash site, the famous special Shock Rave sites which belongs to Macromedia, all adopt the Shockwave Flash and Director. We can say that Flash has grown to become known quantity standard about interactive. It's the mainstream in the future on web page. Flash is launched the excellent web animation design software by MACROMEDIA company in June 1999 in the United States. It is a kind of tool for interactive animation design, it can innovatively interfaces music, sound, animation to be together, in order to produce high quality dynamic web pages effect.

FLASH software is one of the necessary learning animation professional software, used to draw the picture, make the action, and can also write code at the background, this is a the software that can be applied to paintings guys can also be applied to a software programmer, adapt widely, and easy to show the effect, convenient and quick, so powerful is obvious to FLASH software, more and more people join to use this software, FLASH software combined with popular completely, because it is easy to use, so the popular elements can be placed into the FLASH production in the era of intelligence.

The characteristics of the FLASH: (1)The use of vector graphics and streaming technology. What's the Vector graphics different to bitmap graphics is that it don't change image quality along with the zoom in and out of video, so the flash-makings can be played on any resolution, this is one of it's a big advantage; Streaming technology allows the animation to play while downloading, thus relieve the waiting mood for web browsers. (2)Easy to download. The generated animation (. SWF) file in software production is very small, a few K bytes of animation files has been achieved amazing animation effects. Using that on the web design can not only make the web more vivid, and small and exquisite for downloading quickly. Making animation can be opened in a short period of time and be able to play. (3)The various elements interact together, is another important feature of FLASH software, more and more people have the Flash As the preferred tool when for animation design, and produced many breathtaking animation (film) effect. For example: the early pleasant goat and grey Wolf, that's children's favorite, so Flash software has become a fashion icon of the new method in intelligent era. (4)The powerful animation design in Flash, realizing interactivity through the ACTION and FS COMMAND, making design process has more degrees of freedom, in addition, it has cooperate very well with today's most popular Dreamweaver web design tools, can be directly embedded in web pages, and at any place.

The Composition Structure of the Interface and Basic Principle. *Interface.* Flash interface composited by 4 parts, the menu bar, the main toolbar ,scenario and stage. (1)the main toolbar: using the tools in the main toolbar can draw animation effects what we want. (2)The timeline: the timeline used to organize and control the file content in a certain period of time, the timeline can be divided into the control layer and a time line control area, the major components about timeline is the main component layer, frame and playback head. layer control area: located in the left side of the timeline. Layer just like slide film stacked together, each layer contains a show of different images on the stage. The timeline control area: located in the right side of the timeline, is made up of frame, the play needle and multiple button as well as an information bar. Like film, Flash document divides time length into frames. Frame contained in each layer displayed on the right side of the time line. At the top of the timeline indicates a frame number title. The play needle indicates the stage in the current frame. (3)Scenario and stage: the scene is the largest activity space, like a full length drama, all animation include more than one scenario. The scene is what we often say the stage, is a rectangular area where we editing and playing animation . (4)And a menu bar is where all the control button in the FLASH software can be found in it.

The Basic Principle. The animation made by frame and tweening. FLASH use the principle of animation., cut each picture into the frame. The animation the generated when broadcast quickly .but due to the high compression of the flash document, the file is very small. It also can be programmed to control the animation playing, which is easier to control the animation. This is the basic principle of flash animation.

Production Process of Flash Animation. One: The animation script : We need a complete animation script before we do the animation. Two: Character design: We can design the model using drawing tool in flash on the scenario and stage before pondering the meaning expressed by the animation script. Three: Scene design: also be made in Flash software. The scene design is the critical step in shaping the film character and style. We should draw scene pictures before reading and understanding the script, mastering the historical background, knowing the characteristics of the Times, deeping in life, collecting materials, keeping the style of scene and character unified. Four: Drawing script: The scenario and stage also can be drawn directly dynamic script in FLASH. The function of script is changing the text to be story. The script is one of the most important part of the whole animation. What we should pay attention is when making animation, we should use good camera language, telling story interesting, lens joining naturally. Five: Drawing element: Drawing elements in Flash scenarios and stage, and then put the components in to library for using them at any time. Six: The original painting: the element such as scenario and model, produced them into original painting. Seven : Export images: we export PNG images frame by frame, the purpose is to add special effects on the frames. Eight: Add special effects: Flash software usually combined with AE, which can make a good animation, making a stronger visual perception.

Knowing ActioScript of Flash in Intelligent Era. ActioScript. ActioScript is the language used on the flash scripting, more used on the developed interactive, entertaining, practical. We can also add logic and other control to the documentation of the media elements use the ActioScript code , in order to write out the interactive applications suitable for user's. This is a big advantage of the flash.

Actionscript Terms. (1)Action:is the instructions which playing file give according to the action editing code. (2)The event: The action when files in play. For example, in loading movie clip, head into the frame, the user clicks a button Or movie clip, or the user press the keys on the keyboard, can produce different events. (3)Class: class can be created to define new types of data types. If you want to define the class, need to use the class keyword in the external script files (4) Constructor: the constructor is used to define the class attributes and methods of function.(5)The event handler: It's a special action manage such as mouse down event or the load events. There have two classes for a total of Actionsript event handler: the event handler method and event listener. In the toolbox "action", each actionsript object wether with event handler method or event listener has been named "Events" or "Listeners" subcategory. Some commands can be used for the event handler as well as be used for event listener, and included in the above two sub-categories.(6) Example: Instance belongs to a class object. Each instance include all the attributes and methods of this class (7)Instance name: instance name is used to the only way to represent in the film clips and button .You can use the "properties" panel to specify name for the instance on the stage. (8) Methods: the method is a function associated with the class.(9)Object: The object is a collection of properties and methods, and each object has its own name.(10)Package: The package is located in the specified class path,it contains one or more class files directory. (11)Property: Property is to define the characteristics of the object. (12)Target path: the target path is hierarchical structure address about the object include instance name in SWF files, variables

ActioScrip Writing. (1)When writing scripts, there have two ways, one is writing directly in "action" panel, code script written here directly stored in the FLA file. Where we are going to give instructions, where to write code, there are two ways to write code.1)Click the frame directly, Which frame we want to give command, we click the frame and then press F9,then enter input the code.2)Or directly click on the element, and then press F9 enter the code.(2)The instance for animation script writing.

For example: the role of the "video demo" button is to load the "video demo" sub-page, button action script is as follows:

```
On (release) {  
Load Movie (" video demo. SWF, "_root");  
}
```

Video play button: the sub-pages of "video demo" provide video clips such as people walking, running, jumping, click on the corresponding button then the player loading the video files which convert to FLV format in advance . Such as the role of "people walk " button is to demonstrate the “people walk .FLV” video, button action script is as follows:

```
on (press) {  
var connection_nc:NetConnection = new NetConnection();  
connection_nc.connect(null);  
var stream_ns:NetStream = new NetStream(connection_nc);  
my_video.attachVideo(stream_ns);  
stream_ns.play("people walking.flv");  
playBtn.onPress=function(){  
stream_ns.play();  
}  
}
```

The characteristics when write animation script: (1)Should to use the function, statement or other language elements, can be directly double click on the corresponding project in the movement to the toolbox, or click add new project to the script above the script pane button, then select the corresponding project. (2)Syntax highlighting. (3)Reminder display code. (4)Syntax checking. (5)Determine the task object.

Debugging Scripts. FLASH can find errors when play the SWF files use the “debugger” provided by the system. Select “control | debugging menu” to open the debugger, the debugger shows hierarchical display list about the movie clips in the current load to the Flash Player, use a debugger, can modify the value of the variable and attribute play the video, and you can use breakpoints to stop SWF files and line by line to track the action script code. In addition, users can also use the output panel display an error message and variable and object list, if you want to observe the change of a variable, should add the trace statements in the script first, and then select "control | debugging film" menu, entering in the status of film test, the system will automatically open the output panel, and displays a variable value and the changes.

Summary

Along with the development of the Flash software, its function are constantly extend and expand in the era of intelligence, at the same time, we can use the Flash animation effect reach a diversifying works. Flash is not only create animation on painting and script code, it can be requested on a higher level of demand. It can be used cooperate with other software to get the effect we want. In any case, I would like to clear that as long as able to take both AS programming skills and outstanding creativity into account, it can create a lot of amazing work. In other words, only to achieve a good combination about animation design drawing and programming language, to create our own perfect animation language.

References:

- [1] WuYiXian, WuMuCheng . Brilliant Flash MX Chinese programming. Beijing .Publishing House Of Electronics Industry.2003
- [2] YangDongYun. Solution for Common Problems In Flash courseware manufacture technology . Science and the Mass,2010(5) :112-113.
- [3] ChenHuiAn. JavaScript Web Page Creation Research[M].Beijing. Posts and Telecom

Press.2002

[4] Zhao Qian. boutique animated film analysis [M] Chongqing: Chongqing University Press, 2010.

[5] Fuguan .Chinese Art Spirit [M] Shanghai: East China Normal University Press, 2001.