Ancient Architecture Animation Design Method of 3D Technology and Its Application

Song Li¹²,*
¹Tianjin University, School of Architecture, Tianjin, 300072, China
²Wuzhou University, Wuzhou 543002, Guangxi, China

*Corresponding author e-mail: 1216206014@tju.edu.cn

Abstract. Ancient architecture animation design method of 3D technology and its application is discussed in this paper. In the film and television animation production, 3D technology in the computer set a virtual real world, film and television animation creator based on the needs of the story using 3D technology in the virtual world to set the appropriate characters and the scenes, and then follow the structure of the story set. The direction of the movement of each model. In the design process, we not only need to consider main scenic spot, activity area, rest area, every main road, but also need to consider the relation between plane and elevation, through the means such as landscape, the use of view, outstanding subject. In the animation, most of the scenes are both roles and scenes exist, the scene is not only designed to then coordinate with the character design, but also as much as possible to assist and coordinate the activities of the character and emotional performance. The proposed methodology in the paper will help us to improve the traditional design pattern.

Keywords: 3D Technology, Ancient Architecture, Animation Design, General Applications

1. Introduction

3D digital technology, which is also known as three-dimensional technology is an emerging technology that comes with the development of computer hardware technology. Early 3D technology because of its high production costs, the difficulty of large, we can only be seen in some CCTV channels and overseas channels, and has not been widely used in costly movies and animation and now 3D animation technology has been widely used in film stunt, parts packaging, advertising design and other fields [1].

In the film and television animation production, 3D technology in the computer set a virtual real world, film and television animation creator based on the needs of the story using 3D technology in the virtual world to set the appropriate characters and the scenes, and then follow the structure of the story set. The direction of the movement of each model [2]. CAT compared with the traditional CS bone design, not only free to then achieve curve animation adjustment, but also to complete the animal's bones stretching action and CAT multi-role skeleton design plug-in muscle elastic animation, suitable for 3D animation film production in high realistic character creation. Automatically read BIP
file capabilities of the CAT Skeletal System to easily capture the files and save the adjusted animations into a BIP-type file to help blend different dynamic blends together to present a true, satisfying Bone design. Therefore, CAT multi-role skeleton design plug-in to achieve a more realistic animation. Therefore, in the following table 1, we present the application scenarios of the 3D technologies.

![2D, 3D with Glasses, Glassless 3D, Hologram](image)

**Figure 1.** The Overview of the 3D Technology

**Table 1.** The Application Scenarios of the 3D Technologies

| Application Scenarios                                              | Detailed Information                                                                 |
|-------------------------------------------------------------------|--------------------------------------------------------------------------------------|
| The Application of 3D Technology in Movie Animation Environment Design | 3D stereoscopic technology can create a realistic environment, so that audiences can appreciate the animation work and feel a real world at the same time. |
| Animation Middle Stage                                           | Map production, the process is the key of a link, through the software tools, based on the simple sense of the actual things, can realize in the form of two-dimensional form of images and 3D image conversion. By combining the 3D model and the design framework, we can achieve simultaneous motion through the connection of the two, thus simulating the real motion effect. According to the realistic scene, make appropriate modifications to the lighting setting, simulate a real scene, and pay attention to the setting of parameters, the change of position and the change of light color in the adjustment. |
| The Application of 3D Technology in Movie and TV Animation Color Design | 3D excellent color design technology, giving the film and animation a distinct sense of hierarchy, and enhance the reality of the movie and animation, which is the difference between 3D movie animation and traditional movie animation and general movie. 3D color visual effects are far better than the color visual effects of ordinary video works, which are the advantages of 3D technology. |

2. The Animation Design and 3D Technology

2.1. Overview of the Animation Design

Under the influence of digital media technology, 3D animation began to be combined with CG technology and appeared in the field of animation design. Therefore, people now see the animation scene and the image are very realistic. When people appreciate realistic animated works, the sensory organs are also easily stimulated, which in turn can easily resonate with the animation works [3]. Therefore, the animation design of digital media technology is more popular than traditional animation works, which also makes the domestic animation design and production a new step. The principles of the animation design are shown as follows.
Table 2. The Principles of the Animation Design

| Principles | Detailed Information |
|------------|----------------------|
| The elements in the UI as real independent, physical properties of the object | All the principles of animation, for example: slow down, slow down, follow, and arc motion, and then all of the discussion is based on this principle, they are quality objects. It is important to turn the elements of the UI interface into separate, distinct objects from the background, giving them the inertia of the action, allowing users to operate them continuously and consistently. |
| All of the animation techniques will enhance a reality to enhance the relationship between animation action and audience. | In real world, when the principal object body sends the movement, if is connected the object can make the followed movement. Animators this kind of observation use in animation, after in the animation main body stop, other parts of details still may the movement. |
| Exaggerated manipulation of animation performance is more realistic. Exaggeration can highlight some neglected details. | We can make it easier for users to understand the interface. They continue to explain or imply for the user the inheritance relationship between the interfaces. Without such clues, users will have a hard time understanding these interfaces. |

In the animation, most of the scenes are both roles and scenes exist, the scene is not only designed to then coordinate with the character design, but also as much as possible to assist and coordinate the activities of the character and emotional performance. For example, when the character is very cheerful, the color tone of the scene cannot be too cold, and when the character is crying, the color of the scene cannot be used too warmly and joyfully [4]. The color of the scene is one of the important tools that every director uses to convey and personalize the movie. In the figure 2, we show the principles.

![Figure 2. The Animation Design Principles](image.png)

Flash animation than traditional animation, animation effects can be rendered more three-dimensional and vivid, this is one of its advantages. The second advantage of flash animation is that its operation flow is very simple, design functions are perfect, such as painting, editing, composition and
effects and other functions are readily available [5]. So whether it is to create and design an animation from scratch, or to modify, perfect and supplement the animation that has been completed initially, all of them can be quickly completed by the flash production software. We can consider using this in the real design activities.

2.2. The 3D Technologies
As a result of 3D animation movie picture design extremely real smooth, unfolds picture effect extremely high quality, therefore the 3D animation has received from the very beginning generally and pursues audience's attention holds. Accurately set the position of the camera in the 3D animation scene, and add lighting according to the real effect and the size of the animation scene [6]. For single-frame screen, you should choose the "three-source lighting" lighting theory, "three-source lighting," including fill light, backlight and the main light source. During the addition of lights to the animation scene, the subject light position and light source intensity must be well defined before further setting the position and intensity of the auxiliary light source. 3D software has been stored in a variety of natural and vivid real-life actions and expressions, so that you can directly use the animation to make the animation action more natural and fluid. As a person eating, you can use the eating mode and in the case of people have been set, a person can be as normal as we eat in real life, more real, closer to life. Java 3D is a part of the Java media component in the Java API developed on the basis of the existing image API and the latest three-dimensional graphics technology, and can be effectively applied to various platforms [7]. Java 3D API is mainly used to construct the landscape structure, Scenes include super structure elements, virtual world objects and local objects, and a series of branch images, such as the sky, sea, ships, etc., in the marine environment as 3D prototypes, and nodes in the bokeh.

Therefore, we can consider the principles of the 3D technology as the following aspects. (1) The use of 3D technology for animation works screen design can not only make the animation screen presents a natural, beautiful feeling, its clarity and fluency are also two-dimensional animation [8]. The use of 3D technology can create a lot of grand scenes, such as galloping horses, fierce battlefield and other pictures, but also can show many two-dimensional animations cannot show the science fiction, magical, fantastic, abstract picture. (2) The action of characters in 3D animation is mainly conveyed through the facial expressions and body language movement of the characters. Unlike 2D animation, the 3D animation role in movement was mainly controlled by internal bone system, so the role of the skeletal system should follow role body structure to design the building, will give the later expressions and movements to lay a good foundation [9]. Such as in the design of a fat when you walk, the role of the bone structure of scaffolding must conform to the shape characteristic of the fat and the sports movement characteristics, only in this way can create a real image of the role. (3) The movie and TV animation scene is the typical space environment of the plot and the role activity, and it is the main creation link of the animation style. The animation scene design under 3D digital technology has also completely different expression language with 2D animation. It breaks through the traditional cartoon line oriented modeling way, but simulates the real light and shadow space as the main modeling element [10].

3. The Ancient Architecture Animation Design Method of 3D Technology

3.1. The Animation Modeling
3DSMAX is an image rendering and rendering software based on 3D animation technology. Prior to the advent of 3DSMAX technology, the most widely used CGI graphics workstations in the CG design process were SGI workstations based on DOS technology as operating systems and high demands on technicians. Because of this technology is mainly run under Windows system, in the design, graphic design more reasonable as operation more convenient, the 3DS Max become the main current of PC 3D modeling software [11]. Currently the most mainstream on the market, the most typical of the following types of modeling software, the next one to understand. Blender is a free 3D modeling
tool, ideal for the initial stage of VR development and learning. Teaching resources on the internet can help you quickly understand how to use them. Maybe other 3D modeling tools will provide more and more powerful features, but for starters, Blender is enough, and is completely free [12]. Blender's interface is fairly simple and easy to then use. ② Autodesk's Maya and 3ds Max, can be described as the industry standard 3D modeling, the development process is quite long. Maya is a better choice if your goal is to become a professional, Maya provides richer and more powerful control, and Maya's ability to perform animations is great, and can be arguably done by many tools as the best. 3ds Max provides powerful, professional modeling capabilities with a wealth of control options that make it easier than Maya. ③ If we can master Maya or 3ds Max, we are fully capable of producing great 3D models. If you want to become a better 3D artist, more competitive in this area, we can also learn 3D modeling software such as Cinema 4D, MudboxZBrush.

Demand animation uses the dynamic changes of the graphical symbols to show the dynamic content in the demand model and simulate the execution of the target software to help better understand and verify the requirements model. In recent years, many research efforts have attempted to provide demand animation functionality for different requirements modeling methods and tools [13]. Therefore, the primary models can be summarized as the follows.

1) The SPIN tool developed by Holzmann et al. Converts the state in Promela's requirements specification into execution; UPPAAL uses the Autograph tool to demonstrate the migration and state in the time automaton. To the certain extent, the demand model can be expressed more intuitively and dynamically, so that developers can debug and understand the demand model. But the graphic symbols used in the animation correspond to the formalized symbols in the model. For non-professional users, these symbols are difficult to understand.

2) Tools use real-world graphics and images as animated execution elements that drive the execution of these animation elements using the requirements model. These tool-generated animations facilitate non-professional user understanding and facilitate communication between users and developers. Animation action is the basic action is defined by calling the SceneBeans library. This approach requires developers to control every step of animation execution. This kind of tool is automatic animation generation low, animation production requires a lot of labor involved and if LTSA takes a lot of human written descriptions of animation execution XML script. This method absorbs the advantages of these two kinds of dynamic modeling methods, the user easy to understand graphical symbols for use, and high degree of automation.

The simulated behavior in this area usually moves from a limited, controlled effect to a real world group in a particular situation. Ideally, the results of the simulation are consistent with real population movements. The purpose of researching the quality of visualizations is to make the behaviors and appearances of individuals in the group diverse and to increase the rendering speed of the scene. In the process of requirement modeling, although the viewpoints are relatively independent, the demand information from different viewpoints may overlap. As the result, there are overlaps and differences between requirements models that arise from different viewpoints, potentially resulting in conflicting requirements and inconsistencies between requirements models. In addition, some viewpoints possibly use the different demand modelling method and the technical construction demand model, increased the viewpoint easy to have the demand conflict and the inconsistent possibility. Therefore, in forms in front of the final demand terms of an agreement, must examine and process the demand conflict which the viewpoint exists and the inconsistent question, guarantees the complex system the demand accuracy and the uniformity. The viewpoint examination mainly includes 3 parts, namely grammar inspection, semantic inspection and the system performance examination. Among them, the first two core inspections needs separately carries on in the viewpoint and the viewpoint, system performance examination main use behavior sequential logic system check system characteristic and so on. In the table 3, we summarize the latest models.
Table 3. The Latest Models for the Animation Modeling

| Models | Detailed Information |
|--------|----------------------|
| Smis et al. Proposed an animation generation method based on natural life model | As an autonomous agent, fish has created artificial fish simulation animation system including biomechanics model, geometric display model, perception model, the motivation model and behavior selection mechanism. Choose from a set of basic behaviors through fixed, prioritized rules. These include avoiding obstacles, eating, mating, escaping, swimming, and leaving. It is a typical representative of agent-based group animation to realize the biological activities such as fish hunting, mating, cluster and escape. |
| Brogan et al. Rule based combination model realizes individual obstacle avoidance by building various fields and generating and combining all kinds of forces among individuals, individuals and environments. | The algorithm is divided into two steps: step 1, the perceptual model determines whether the individual and the obstacle are visible; In step 2, the placement algorithm determines the location and speed of individual and obstacles for each individual. Because of the setting of the continuous behavior, the complexity of calculation, the restriction of the system balance and the lack of the penetrating correction behavior, they did not solve the problem of penetrating problems between individuals completely. |
| Musse et al. proposed a hierarchical model for real-time simulation of virtual population. | The available groups can follow the order specified by the user at run time; Programmable groups follow predetermined behavior; Autonomous groups use events and counterforces to produce more complex behavior. |

Most current 3D modeling systems provide animations, most of which are well equipped with authoring tools that match the camera with the real scene, the design of the sound effects, the modification of any object in the scene, the high-quality rendering tools, and the various A combination of special effects to create realistic movie-level animation. This method is based on the triangular surface, the integrated point, line, surface free editing and integration [14]. Surface modeling method is based on the numerical function of the model building process is necessary to define the surface and curve set up to achieve without affecting the model surface on the basis of the fineness of the surface to be flexibly adjusted, so this method in the current and the three-dimensional animation modeling practice is widely used. Sculpting modeling is a new modeling method for sculpting polygons and surface surfaces. Texture replacement model mainly refers to the use of texture map form, by the light and shade value according to mapping in the geometry of the surface layer, and then to change the surface modeling method in the form of the concrete pattern. In the building class three dimensional animation model design and mainly is draws support the 3Dmax software, the foundation correspondence three dimensional animation roaming way, realizes to the video frequency document model construction. The building class three dimensional animation may bring the omnidirectional stereoscopic effect for the view, causes the human to experience personally, can realize certain simulation effect. In the model construction, the hypothesized city scene and the reality existence compares has the very big superiority, if in some links and the structure adjustment and the revision, only needs in the animation to operate then, the effect consummation is manual auxiliary then achieves merely by the corresponding chart article form, thus production information inquiry expression [15].
3.2. The Ancient Architecture Animation Design

In architectural design, we should pay attention to the combination of the mood, designers need to inspect the actual terrain, combined with the surrounding environmental characteristics, the use of scientific layout, a variety of favorable factors, rational arrangements for the construction, and the surrounding environment to transform and create unique characteristic buildings.

![Figure 3. The Sample Animation Modeling Design](image)

**Figure 3.** The Sample Animation Modeling Design

In the design process, we not only need to consider main scenic spot, activity area, rest area, every main road, but also need to consider the relation between plane and elevation, through the means such as landscape, the use of view, outstanding subject. At the same time, when designing the ancient buildings, the thematic landscape should be highlighted, which will show the beauty of the plants and create a quiet and comfortable environment. Therefore, for the design, we have the following suggestions.

- In the layout of ancient buildings, the need to integrate the environment and the surrounding space for buildings of the different sizes, we can use the central axis of scattered around the layout of buildings.
- In China's ancient architectural group layout, the courtyard is the main layout means, that is to set a central axis in the center of the ancient building group, and the building is distributed in a symmetrical way for two weeks. Although the layout has closed features, people can enjoy different views in the complex.

![Figure 4. The Ancient Architecture Animation Design Illustration](image)

**Figure 4.** The Ancient Architecture Animation Design Illustration
- Plants in the ancient architectural design to reflect the theme of the landscape principles: from the theme of ancient architecture reflects the theme of plants and time-division, the meteorological system of the "beauty of time." Thus for the entire ancient architecture to create elegant, pleasant with the comfortable group landscape. Achieve the primary and secondary distinct and orderly, emphasizing the science collocation of trees, shrubs, flowers and creates the four seasons landscape of "spring flowers, summer shade, autumn real, holly".
- In China, the frequently presented yard in architectural planning is the method of introducing natural space. The yard not only provides good conditions for lighting and ventilation for the construction, but also makes the construction space full of poetic.

4. Conclusion
Ancient architecture animation design method of 3D technology and its application is discussed in this paper. The ancient Chinese architectural design and application of the structure for the entire building art has a great promotion effect, especially in the analysis of ancient architecture of different materials, the integrity of different structures, the formation of the corresponding technical analysis, have a great concentration value. In the design process, we not only need to consider main scenic spot, activity area, rest area, every main road, but also need to consider the relation between plane and elevation, through the means such as landscape, the use of view, outstanding subject. At the same time, when designing the ancient buildings, the thematic landscape should be highlighted, which will show the beauty of the plants and create a quiet and comfortable environment. Therefore, this research proposes the novel perspective of enhancing the 3D based design that will be meaningful.

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