

Research Article

Analysis in Making Animation Movements Using Traditional Methods (Keyframe) and Motion Capture Methods

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Abstract.

The keyframe method for making 3D animation movements is a traditional technique used by animators around the world to create certain animation movements based on the 12 principles of animation. Meanwhile, motion capture is a motion recording technique used to describe the process of recording movements and interpreting these movements into a digital model. Motion capture itself is commonly used in the military, entertainment, sports, and other fields. In this study, we analyze the use of the two methods, the results of which can be used as a suggestion for the use of the two methods for the production of animated films. Three aspects were used to analyze the two methods, namely the number of keyframes, the level of refinement and detail, the final process and cleanup.

Keywords: keyframe, motion capture

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1. INTRODUCTION

The keyframe method is the simplest animation technique used by animators to move an object. Based on the idea that an object has an initial state or condition, and will change from time to time in position, shape, color, luminosity or other properties to several different forms. Keyframing takes the position that we only need to mark certain frames to describe changes in an object, whether in position, rotation or size. And this method can be used in 2D and 3D animation.

As time goes by, animation techniques are increasingly developing following existing technological developments, currently animated films are not only made using the keyframe method but some also use motion recording or motion capture techniques, which use the human body as a reference in creating movements.

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2. METHODOLOGY/ MATERIALS

2.1. Keyframe technique (traditional)

Traditional animation or better known in English “traditional animation” or it can also be CEL animation. It is said to be traditional because it is made using hand drawings. This technique is the first type of animation in the world. It is called cel because at first this animation was made of sheets called celluloid, which is a transparent sheet of paper. This technique is done manually or by hand, and the movement process uses many frames so each animation requires around 25 frames. In traditional 2D animation, the animators use sheets of paper to create moving images that can be seen after being played. Meanwhile, in 3D animation, the animators create a keypose and also breakdown poses to create movement within different keyframe ranges so that it becomes a movement that is solid.

2.2. Motion recording technique (Motion Capture)

Is the terminology used to describe the process of recording movement and interpreting that movement into a digital model. It is used in military, entertainment, sports, medical applications, and for the calibration of computers and robots. In filmmaking and video games, mocap means recording the actions of human actors and using that information to animate digital characters into two-dimensional or three-dimensional computer-animated models. When it includes the face and fingers or capturing subtle expressions, this activity is usually referred to as performance capture.

2.3. SWOT analysis

3. RESULTS AND DISCUSSIONS

From the method analysis above, three aspects can be applied as indicators for assessing the two methods. In terms of the number of keyframes, the motion capture method has a greater number than the keyframe method. This has an impact on aspects of the level of smoothness and detail, because it requires many motion capture frames to have a higher level of smoothness. At the same time, in the final and cleanup process aspects, motion capture takes longer and is more complicated than the keyframe method. The following is a comparison table of the three aspects of the two methods.

TABLE 1:

SWOT analysis	Traditional method (Keyframes)	Motion record method (Motion capture)
<i>Strength</i>	The costs required for the work are cheaper, and we will have more freedom to explore a movement that we want to make. And finally, we are free to determine the style of the animation movement.	The output of the animated movement will look more real like real human movement, the processing time when shooting can be much faster.
<i>Weakness</i>	The level of smoothness of movement depends on the abilities/skills of the particular animator.	The costs incurred will be much more expensive, the cleaning process will take a relatively long time because there are so many keyframes produced
<i>Opportunities</i>	currently there are still many foreign and domestic animation studios that use the keyframe method at the stage of working on motion animation.	Many foreign film studios use the motion capture method to animate 3D characters that play roles in live action films such as The Lord of the Rings and Avatar.
<i>Threat</i>	More and more methods have emerged for making animations that are much faster by using AI (artificial intelligence) in the manufacturing process so it is possible that in the future, this (traditional) keyframe method will no longer be used due to technological developments.	Many animation and film studios are still hesitant to use motion capture techniques due to limited costs and knowledge in the field of motion capture.

4. CONCLUSION AND RECOMMENDATION

Based on the explanation above in analyzing the creation of animated movements between using the keyframe method and also motion capture, it can be concluded that:

Traditional methods (keyframes) are still widely used today by animation studios abroad and domestically because is practical and does not require special tools.

Motion capture is more suitable for filmmaking animation that is stylized as semi-realistic or realistic or used on making live action films in which there are 3D characters that you want to move.

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