

Article

Analysis in 3D Rendering Modeling Processing using Autodesk Maya and Blender Software

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Abstract: Many alternative software for producing 3D animation. Some of them are Autodesk Maya and Blender. In the animation pipeline there are three main stages, namely pre-production, production and post-production. In post-production there are rendering or rendering steps. Rendering is the processing of all animated scene objects in the form of modeling data, movement, texturing, lighting, sound and so on into a certain output which is the final appearance of an animated video. In this research, we analyze the performance of the two 3D software above in rendering an object. Rendering using Autodesk Maya takes 45 seconds. While the results of rendering using Blender can complete in 1 second. In terms of rendering quality, Autodesk Maya produces more detailed texturing quality.

Keywords: 3D Rendering; Autodesk; Maya; Blender Software

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1. Introduction

Animation is a collection of images arranged in an orderly manner so as to create a movement with a predetermined calculation. Animation has various types one of which is 3D animation. In this era, 3D animation has developed quite rapidly. This development is marked by the large number of 3D animation works circulating among the public, in the form of films, television series, video games, and even advertisements. 3D animation itself has the meaning of creating moving images from a collection of 3-dimensional images that can be seen from several perspectives and points of view. Making 3D animation can use various software, one of the software for making 3D animation is Autodesk Maya and Blender. In making 3D animation the same as with other types of animation that still uses 12 principles of animation, pre-production, production and post-production. In post-production there are Render or rendering stages. Rendering is the processing of all animated scene objects in the form of modeling data, movement, texturing, lighting, sound and so on into a certain output which is the final appearance of an animated video. In this process, 3D animation is illustrated into a realistic display by simulating real-world principles. Determine the direction of the light that will be reflected or hit, the texture of an object, the blur effect, the color and so on to simulate like in the real world or be changed with a card style and so on.

2. Materials and Experiment Methods

In this study the authors used a qualitative method by analyzing the 3D rendering process in Autodesk Maya and Blender software. The research data was obtained from observing books, journals, articles as well as social media platforms that discussed rendering processing in the two softwares.

2.1. Rendering process on Autodesk Maya software

In the process of rendering the Autodesk Maya software, there are many textures in the software. Some of these textures such as blinn, lambert, Arnold and others. In general, using Arnold's texture rendering to simulate textures more like those in the real world or use a cartoon style. The steps or how to render on Maya Arnold are as follows:

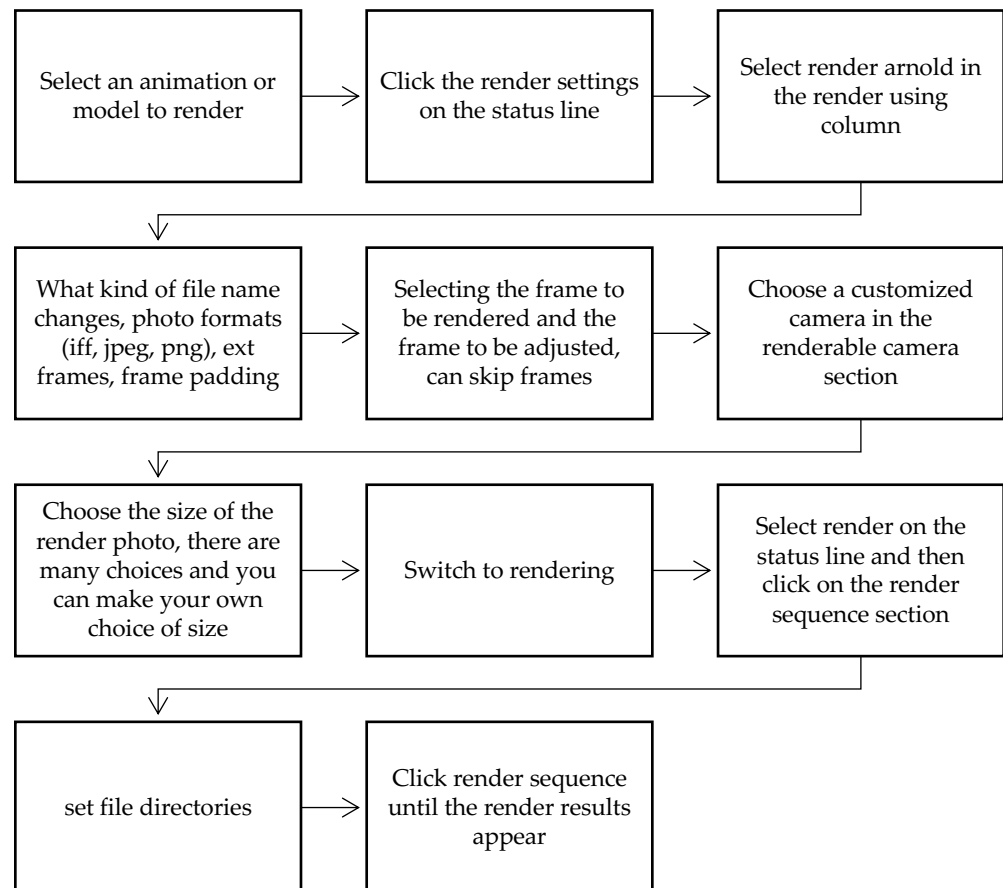


Figure 1. Step or how to render on Maya Arnold

2.2. Rendering process in Blender software

As with the rendering process of the Autodesk Maya software, there are also many textures in the Blender software. These textures are like Eevee, Workbench and Cycles. Blender's rendering process is almost similar to Arnold's, who adjusts the settings first. At the Blender rendering stage using rendering Eevee. The steps or how to render in the Eevee Blender are as follows :

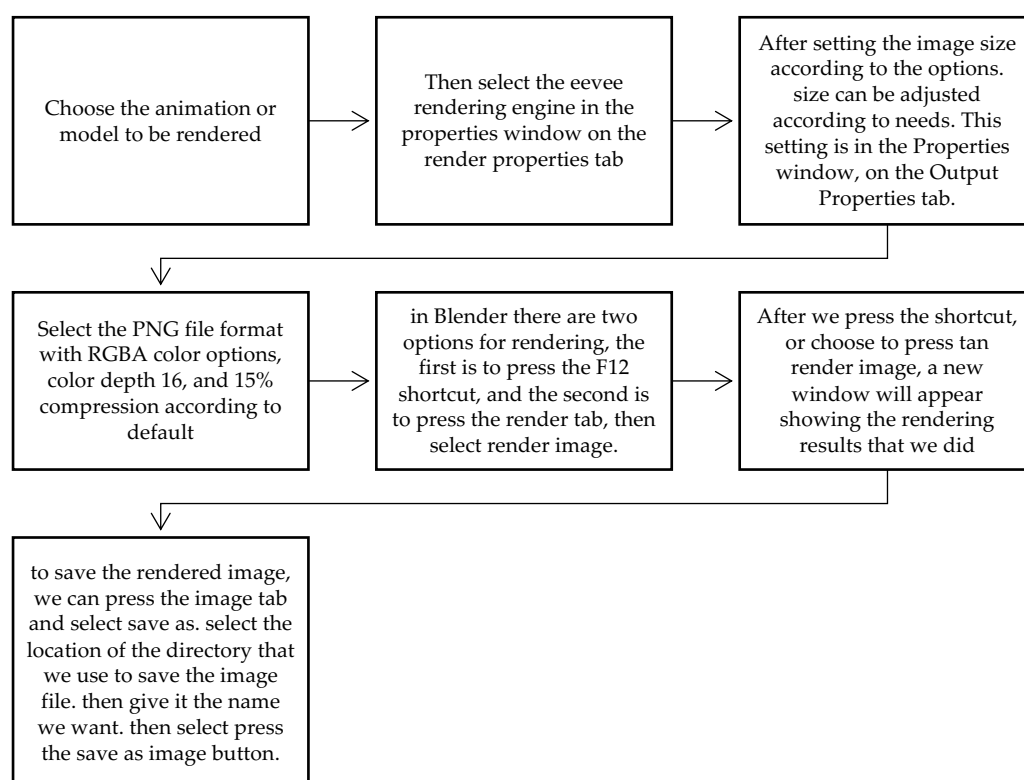


Figure 2. Step or how to render on Eevee Blender

3. Results and Discussion

From the second stage of the Autodesk Maya and Blender software above, the rendering process produces several differences. The following is the result of rendering processing from both software.

Table 1. rendering results of Autodesk Maya and Blender

Software	Result	Processing Time
Autodesk Maya (render Arnold)		45 seconds
Blender (render Eevee)		1 seconds

In terms of speed, time duration and quality of visual results. Autodesk Maya takes 45 seconds to render an image object. Meanwhile, the duration of image rendering processing in Blender is only 1 second. In terms of quality, rendering using Autodesk Maya displays detailed image texture results. Whereas in Blender the quality of the image rendering results looks soft and the texture is not detailed.

Rendering on Autodesk Maya using the Arnold texture function besides taking quite a long time is also quite heavy. Especially if you use CPU-based hardware only. Therefore it is recommended that when rendering Maya Arnold, you can upgrade it by adding a GPU device. As for rendering in blender using the texture function eevee has quite light characteristics. However, in terms of the completeness of the features or tools in Blender, it is still more complex than the Autodesk Maya software.

4. Conclusions

From the rendering process between Autodesk Maya and Blender software, both have their own characteristics. For the needs of an animation project, you can do a combination of the two software to produce a satisfactory rendering with good performance. For example, when carrying out the process of making modeling, rigging and animation, you can use Autodesk Maya software. Furthermore, when doing the rendering process, you can use the Blender software. But back again to the needs of each creator for the theme of a project.

Supplementary Materials: The following supporting information can be downloaded at: www.mbi.com/xxx/xx, Figure S1: title; Table S1: title; Video S1: title.

Author Contributions: For research articles with several authors, a short paragraph specifying their individual contributions must be provided. The following statements should be used “Conceptualization, A.A.; methodology, A.A.; software, B.B.; validation, A.A., B.B. and C.C.; formal analysis, C.C.; investigation, D.D.; resources, C.C.; data curation, A.A.; writing—original draft preparation, B.B.; writing—review and editing, A.A.; visualization, B.B.; supervision, C.C.; project administration, X.X.; funding acquisition, Y.Y. All authors have read and agreed to the published version of the manuscript.” Authorship must be limited to those who have contributed substantially to the work reported.

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Appendix A

The appendix is an optional section that can contain details and data that are not included in the main text, such as explanations of experimental details that would disrupt the flow of the main text but are still necessary for understanding and reproducing the research shown; figures of replicates for experiments with representative data shown in the main text can be added here if brief, or as Supplementary data. Appendices can contain mathematical proofs of results that are not central to the paper.

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