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A Short Film Making With 3D CGI And Live Action Footage Usage Using Compositing Technique And Key Frames Method

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***Abstract*—— A 3D CGI film combining with live action footage or we called as the real life, are now widely used by the world film industry. Combining 2 object containing the unique of visualization and showing us the art of 3D CGI. In a movie, director choose to take a path using the 3D CGI than real object due to optimize the cost and creating scene which is currently impossible to do it with real life. To achieve that, a short film combining 3D CGI with live action footage was created, developed by using Blender 3.72b and Adobe After Effects CS6. Technique used to make this film by composing technique and Key frames method**

Keyword—3D CGI, live action footage, short film

I. INTRODUCTION

3D Computer-generated imagery or 3D CGI has transformed the modern film industry from subtle digital mating and duplication effects designed to improve background scenery to complicated rich digital light effects and even computer-generated characters. A compositing techniques nowadays is used for combining of visual elements from separate sources into single image or scene, often to create the illusion that all those elements are parts of the same scene, live action shooting for compositing is variously called "chroma key", "blue screen", "green screen" and other names[10]. And as for keyframes, surely for the characters of CGI people more tend using the motion captures method, but for another objects like building, cars, and the other inanimate objects, keyframes tend to have the most detail of all the frames within the action, which is why there are many of CG artist that is still using the keyframes to do the animation.

3D CGI technology has made it easier than ever to create convincing effects for even the most outlandish stories and settings, however like any powerful tool when 3D cgi's mishandled and poorly implemented the results can be disaster. Based on the literature that I have been reviewed, there are several things that need to be noted. Such as in Comic-8 Casino Part 1 [2] and Comic-8 Casino Part 2 movie[3], the texture of the object is not completed yet, they tend to make it more dark but they forget to use another texture such as specularity to make the skin is shiny just like our skin being reflected from the sun. So is the Dear vs Bear from Bollywood[3] when they are appearing the Bear as the CGI, but they didn't using any diffuse texture, which is shown when the Bear doesn't have any shape on the body, just a fur. Not only in Indonesia and India, in Keizoku [6] a movie series from Japan using CGI as their monster in a building scene, but the shadow is not shown, even though it has been spinning around in lighten area. Even in Hollywood, the movie called Odd Thomas[7] also forget to give shadow for the object while moving around in the table.

Compositing is a technique which brings together several elements in the image or remove something that is not needed in the image. The purpose of the use of compositing namely to help realize the visual concepts that are not can be made at the time set [1].

Key frame is the frame which can represent the salient content and information of the video[4]. The key frames extracted must summarize the characteristics of the video, and the image characteristics of a video can be tracked by all the key frames in time sequence[4]. A basic rule of key frame extraction is that key frame extraction would rather be wrong than not enough [4].

Nowadays, there are so many film not only in Western, Asia even in our country also starting to use VFX or CGI to make a scene for their works. But they tend to use the same fps which is 24 fps, even though they can make it more higher than that. Also to make the cgi and live action footage blend naturally they often to forgot small things like a glossy texture, shadow, light path and reflection from the sun. From the moment this kind of problem has been found, a short film has been created using 29.97 fps and aims to blend cgi and footage naturally so it can be seen to be more blend using compositing technique and keyframes method.

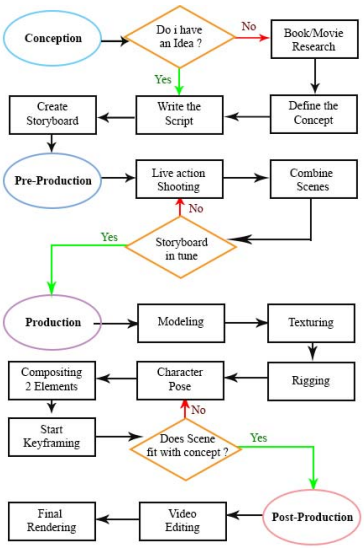

Fig. 1. Flow chart of creating a short film

II. DESIGN

In a process of making a short film, there are 4 stages involves from conception, pre-production, production until post-production. The following steps for each stages will be different depends on the requirements of the film itself.

A. Modeling Character

Modeling is the process of creating a 3D representation of any surface or object by manipulating polygons, edges, and vertices in simulated 3D space[16]. First of all, for the modeling it needs a concept art like a hand drawing or even with pentab using software such as SAI or Photoshop. After that, bring the concept art to the Blender and start with adding concept art as background image then start mesh shaping.

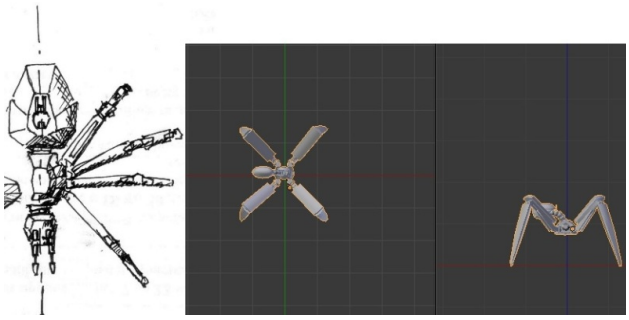

Fig. 2. Modeling character from Concept Art.

B. Texturing Character

When the model is ready, texture needs to be applied. The texture has more than 5 ways to do it, it can be added with the colored one, normal map, displacement, specularity or even occlusion. But it needs more time to do that also a higher specification of computer, for now make the texture with colored one and adding a bump with the node editor.

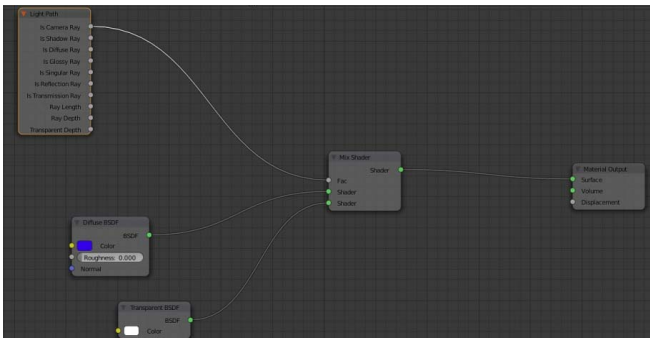

Fig. 3.Adding Texture with node editor

UV mapping is the 3D modeling process of projecting a 2D image to a 3D model's surface for texture mapping[15]. UV Map is important in texturing, because in case the model needs more than 1 texture, selecting the parts of mesh which needs to be textured differently and then start positioning the part of model into the textured image.

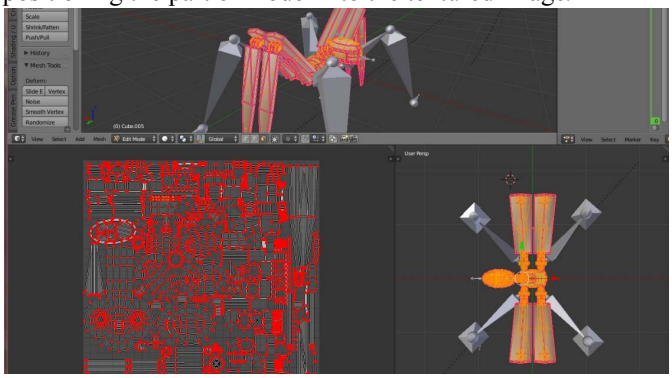

Fig. 4. UV Wrap in Edit Mode

C. Rigging Character

In its simplest form, 3D rigging is the process of creating a skeleton for a 3D model so it can move[18]. Most commonly, characters are rigged before they are animated because if a character model doesn't have a rig, they can't be deformed and moved around[18]. For the first rig, it should be applied in X axis as is parallel with the model. Adding a bone with Armature function then extrude one by one for the bone following the shape of the model.

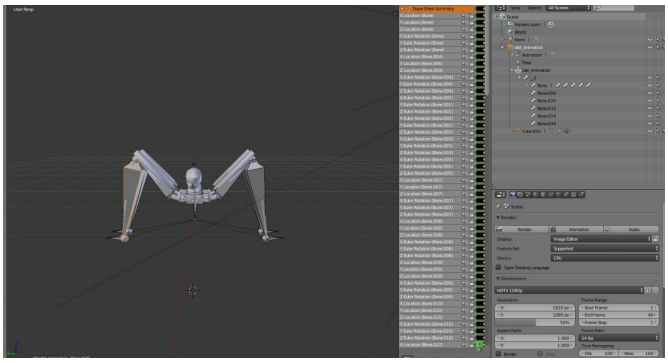

Fig. 5. Adding a bones

The rig doesn't have to be applied in all shape of the model, because it can be mirrored using aArmature properties and then Mirror. The mirrored side should have a different names with the other side, it can be done with Flip Names. After all the rig has been placed, the rig should have a connection with the model with automatic weights setting.

D. Shadow in Character

Shadow mapping or projective shadowing is a process by which shadows are added to 3D computer graphics[14]. Shadows are created by testing whether a pixel is visible from the light source, by comparing the pixel to a z-buffer or depth image of the light source's view, stored in the form of a texture[14]. Adding a shadow in blender can be done with plane mesh in front of the camera after it has been given with camera track. Setup the plane as the floor of the scene, changed it to transparent and duplicated it so it can be rendered as shadow only.

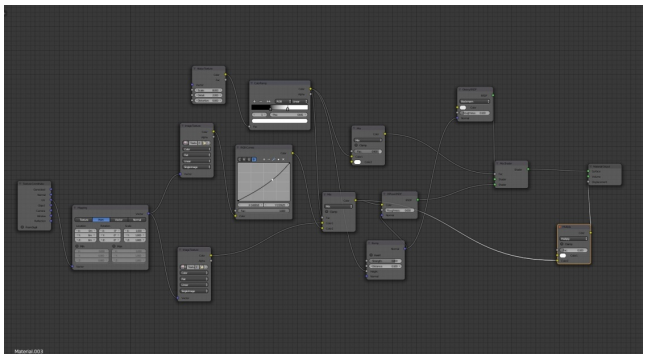

Fig. 6. Node Editor for transparent plane in Shadow setup

E. Match Moving

Match moving is a cinematic technique that allows the insertion of computer graphics into live-action footage with correct position, scale, orientation, and motion relative to the photographed objects in the shot[13]. The term is used loosely to describe several different methods of extracting camera motion information from a motion picture[13]. Sometimes referred to as motion tracking or camera solving, match moving is related to rotoscoping and photogrammetry[13]. Match Moving is using the camera tracking if the footage is not using any markers or screen like blue/green. Camera tracking needs to be added in several objects more than 8 to get a solving camera. After the camera has been solved, when switch into 3D view, the camera will be moving as it was the person who recorded the footage.

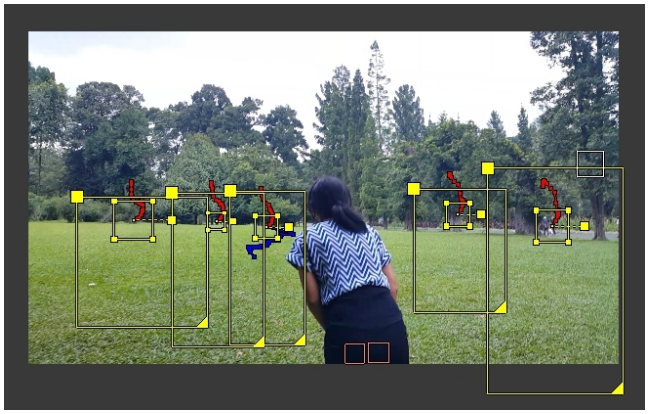

Fig. 7. Camera trackers footage

F. Character Motion

Character Animation requires a different methodology called Pose-To-Pose, and the types of things that must focus on are a bit different than what it will be look for in a more "mograph-like" piece[19]. That is why, character should have a pose before starting doing the animation. Because it will be more efficient than to do it manually every time it needs to be animated[19]. Character pose can be done with moving or rotating or scaling the model using the rig which already given before. Any changes which conducted with position of model needs to be saved in character pose in Blender. And it will be called as it needed in animation later.

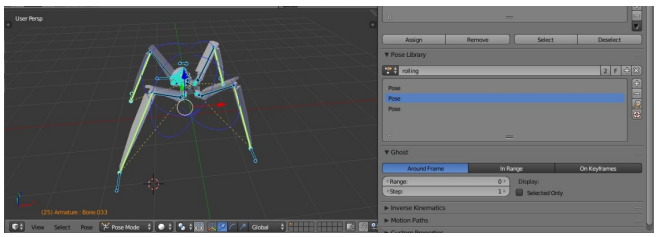

Fig. 8. Character Pose In Blender

G. Character Animation

Animation is making an object move or change shape over time, it can be animated in many ways. It can be moving as a whole object by changing their position, orientation or size in a time or even causing the object to move based on the movement of another objects[19]. While changing a pose of

the object, to saved the past, current or present pose it needs to be set in keyframe timeline[19]. In this section, the object pose has been determined by the storyboard so it won't leading to the other pose which is not in the script.

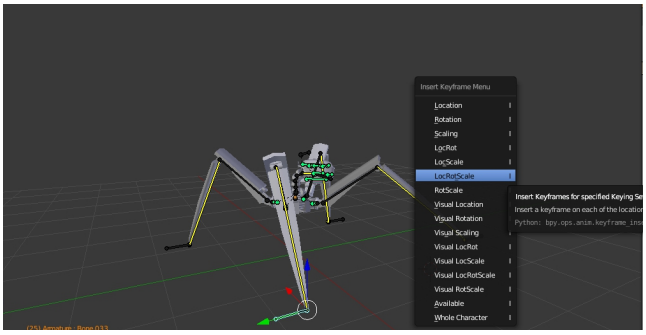

Fig. 9. Example saving animation in Blender

Keyframes is the process of assigning a specific parameter value to an object at a specific point in time[10]. The drawings are called 'frames' because their position in time is measured in frames on a strip of film. A sequence of keyframes defines which movement the viewer will see, whereas the position of the keyframes on the film, video, or animation defines the timing of the movement[12]. Because only two or three keyframes over the span of a second do not create the illusion of movement, the remaining frames are filled with inbetweens[12]. Any animation will be saved in the selected keyframes after doing the keyframes insert and saving location/rotation/scale of the model[12]. The word keyframe comes from the traditional workflow in the animation industry, where only important (key) frames of an animated sequence were drawn to sketch a character's motion over time[12]. Once the keyframes were determined, an in-between artist drew all the frames between the keyframes[8].

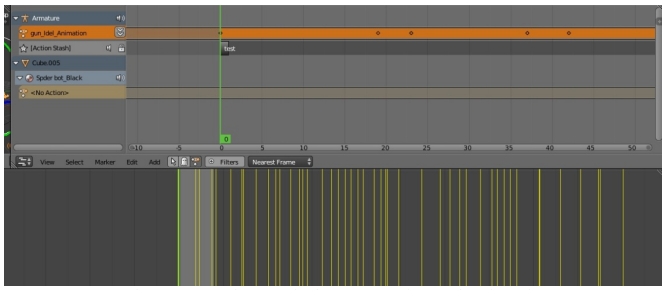

Fig. 10. Keyframes in between of saved animation

H. Compositing Scene

Process of digitally assembling multiple image, videos, music, sound to make a final image for prints, motion pictures or screen design it is the digital analogue of optical film compositing[11]. Layer-based compositing represents each media object in a composite as a separate layer within a timeline, each with its own time bounds, effects and keyframes[11]. All the layers are stacked, one above the next, in any desired order, and the bottom layer is usually rendered as a base in the resultant image, with each higher layer being progressively rendered on top of the previously composited of layers, moving upward until all the layers have been rendered into the final composite[12]. A partial solution to this is some programs ability to view the composite-order of elements (such as images, effects, or other attributes) with a visual diagram called a flowchart to nest compositions directy into other compositions, thereby adding complexity to the render-order by first compositing layers in the beginning composition, then combining the resultant image with the layered images from the proceeding composition and so on[12].

All compositing involves the replacement of selected parts of an image with other material, usually, but not always, from another image[10]. In the digital method of compositing, software commands designate a narrowly defined color as the part of an image to be replaced[10]. Compositing a 3 elements of the footage, model and shadow can be done in Blender, using the Composting screen and Node editor to combining all the materials before it got rendered.

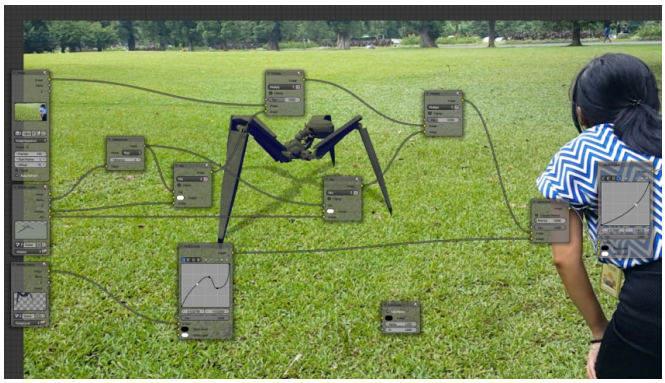

Fig. 11. Node Editor in Compositing

I. Video Editing

Video editing is the process of manipulating and rearranging video shots to create a new work. Editing is usually considered to be one part of the post production process including titling, color correction, sound mixing, etc[17]. After all materials combined into one compositing, it will make the editing more easier to create a final production. In this section, to adjust the raw animation and live action footage into the real script or storyboard it needs more touch especially on the color correction, adding a character voice and music theme using Adobe After Effects CS6.

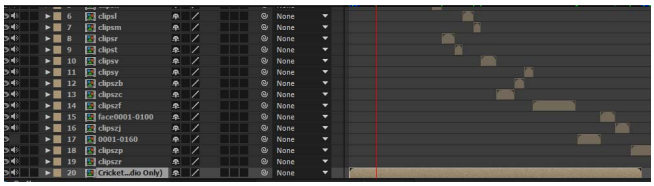

Fig. 12. All materials into one compositing in AE CS6

J. Rendering

After all the process is completed, then the last thing that should do in creating short film is to export the current compositing into the video format so other people could watch it without using the software creator. Which is also called as final rendering, when an animation renders, the program takes the various components, variables and actions in an animated scene and builds the final viewable result. But before it going to be rendered, it would be better if the creator check all materials, scene, object and other things in composition for the last time[20]. For animation, it will takes more times than footage for render, it depends on the texture, complicated scene and the user pc specification. For the last composition it will be proceed the final render in Adobe After Effects.

III. ANALYSIS

A. Interface Analysis

This scene are expected to be the example of how to make a good animation of a 3D CGI in a film scene, especially in Indonesia film industry or any production house. Not only to make a good CGI but also make a good story for their audience. Here are one of many implemented result of the scene in short film with combining 3D CGI and live action footage.

Fig. 13. One example of scene in short film

B. Parameter Analysis

In this parameter analysis will be included with frame rate, audio bit rate, and frame width/heights. The parameter of video will be analyzed with 2 different software, Media Info and Media Classic Player.

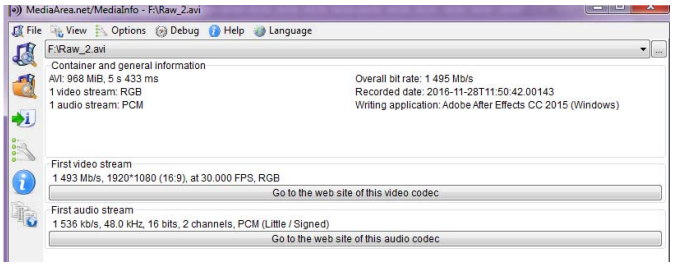

Fig. 14. Parameter Analysis on Media Info

As in Media Info, it shown that frame rate of the video is 30.00 fps which is 3 fps more higher than default 29.97 fps, and the Video size is 1920 x 1080 pixels.

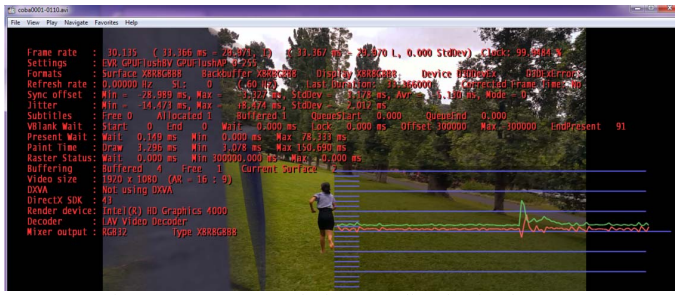

Fig. 15. Parameter Analysis on Media Classic Player

And for the second parameter analysis is Media Classic Player, it shows that frame rate is the same as above which is 30.135 fps which is 16 fps more higher than the default set is 29.97 fps and Video size is 1920 x 1080 pixels.

C. Video Usage Analysis

For the video usage will be analyzed using 3 different video player, Windows Media Player, VLC Player and Pot Player.

For the hardware will be using 2 different kind of specification, high specification and the middle specification.

Table 1. Video Usage Analysis Software 1

Software Analysis	**Windows Media Player**	
	11% of CPU Usage	103 MB Memory Used
	VLC Player	
	9% of CPU Usage	123 MB Memory Used
	Pot Player	
	7% of CPU Usage	112 MB Memory Used

For the first the analysis on above, Hardware which has been used is high specification with Intel Core i5 2500k as processor, 12GB RAM and GPU NVIDIA GeForce GTX 970 4GB. As the result, it shows Pot Player have the lowest usage

on the other players but for memory used the lowest one is Windows Media Players which is 103MB

Table 2. Video Usage Analysis Software 2

Software Analysis	**Windows Media Player**	
	15% of CPU Usage	78 MB Memory Used
	VLC Player	
	14% of CPU Usage	124 MB Memory Used
	Pot Player	
	17% of CPU Usage	142 MB Memory Used

From the last analysis on above which has middle specification of hardware using Intel Core i3 5005U, 4GB RAM and GPU NVIDIA GeForce GT 635M 2GB, VLC Player have the lowest usage which is 14% but for memory used the lowest one is Windows Media Players which is 78MB.

IV. Conclusion

Making a conclusion from the research methodology, design until analysis, there are several notes to take:

1. In order to make a realistic CGI, it needs a good texture of the model and the compositing technique to blend the footage with CGI and shadows.
2. Using a camera tracking will help the footage to solve the camera problems when it recorded with non-tripod camera, such as phone camera.
3. Creating this short film with combining a 3D CGI and live action footage expected to be one of many example for Indonesia film industry to make a better CGI or VFX for their work.

V. References

[1] Azhar, Fajar Chaerul., and Adi, Anggar Erdhnina, "e-Proceeding of Art & Design" : ISSN : 2355-9349, Vol.3, No.3 December 2016, Page 507-514

[2] Fajar, U. (Producer) and Anggy, U. (Director). 2015. Comic -8 Casino Kings Part 1 [Motion Picture]. Indonesia: Falcon Pictures.

[3] Fajar, U. (Producer) and Anggy, U. (Director). 2016. Comic -8 Casino Kings Part 2 [Motion Picture]. Indonesia: Falcon Pictures.

[4] Liu,G., and Zhao, J., "Key Frame Extraction from MPEG Video Stream ", Proceedings of the Second Symposium International Computer Science and Computational Technology (ISCSCT '09) China, 26-28, Dec. 2009, pp. 007 -011

[5] Naresh, K. (Producer) & Sanjeev, V. (Director). 2014. Dear vs Bear [Motion Picture]. India:Bollywood Colour Yellow Pictures.

[6] Ueda, H. (Producer) & Tsutsumi, Y. (Director). 2014. Keizoku 3 [Motion Picture]. Japan: TBS.

[7] John, B. (Producer) & Stephen, S. (Director). 2014. Odd Thomas [Motion Picture]. United States: Fusion Films.

[8] https://documentation.apple.com/en/finalcutpro/usermanual/index.html#chapter=67%26section=1%26tasks=true

[9] https://documentation.apple.com/en/motion/usermanual/index.html#chapter=10%26section=1%26tasks=true

[10] https://en.wikipedia.org/wiki/Compositing

[11] https://en.wikipedia.org/wiki/Digital compositing

[12] https://en.wikipedia.org/wiki/Key frame

[13] https://en.wikipedia.org/wiki/Match moving

[14] https://en.wikipedia.org/wiki/Shadow mapping

[15] https://en.wikipedia.org/wiki/UV mapping

[16] https://www.lifewire.com › ... › New & Next ›3D Video

[17] http://www.mediacollege.com/video/editing/tutorial/definition.html

[18] https://www.pluralsight.com/blog/film-games/key-rigging-terms-get-moving

[19] https://www.schoolofmotion.com/character-animation-bootcamp

[20] https://www.thoughtco.com/computer-animation-what-is-rendering-140509