

Interior Batik Gallery Using Normal Mapping For Virtual Reality

Ayung Candra Padmasari¹, Christyowidiasmoro², and Mochammad hariadi²

Abstract—We present an 3D Modelling object for batik Gallery in virtual reality with textured material photo, Lighting effect and primitive mess with Normal Mapping Method. Normal Mapping is one of many method to give depht Impression texture and detail for object without many polycount, so we can get efficiency of the computer work without loss of detail desired. in this research we try to explain several techniques in making batik Gallery design textures with modeling 3D, The methods include stage Normal Mapping, Environment maps, bump maps, and shadow maps. The next proccess we can use Directional Light and Point Light for each object to get the impression of depth and real dimension for each texture. The result of this research is to improve the modern batik concept and patterns with immersive 3D Room in Virtual reality.

Keywords—Modelling 3D, Normal Mapping, Virtual Reality.

I. INTRODUCTION

Nowadays batik technology in the present has shown better development marked the emergence by the of new innovation. Batik does not focuss to the manual-traditional working patterns that rely on human power, but has led to trend of the utilization of digital devices. This research developed based journal from Baroto Tavip, (2010), The Development of Indonesian batik design for a strategic step to strengthen identity and advantage of Indonesia creative industry besides to preserving cultural heritage. The development of batik design is huge opportunities because big part of existing batik designs just derived from legendary from ancient design that is developed by combining, mixing and modifying to be thousands design variations in many colorschemes and scales and proportions.

The otherway, preservation of batik in this time seems less to developed, because the use of communication media tend to be monotonous, most of the media using photos and videos in preserving and documentation of the work. In response, packaging and preservation work using technology of virtual reality become one inovation to improve it. Normal Mapping is one of many method to give depth. Impression texture and detail for object without many of polycount, so we can get efficiency of the computer work without loss of detail desired. in this research we try to explain several techniques to make batik Gallery design textures with modeling 3D, The methods include stage Normal Mapping, Environment maps, bump maps, and shadow maps. The next proccess we can use Directional Light and Point Light for each object to get the impression of depth and real dimension for each texture.

The design of Virtual Reality for Batik Gallery in Virtual Reality can improve the expected future innovations in combining art, design and technology, especially for preservation and creation of batik into new media. Another benefit, we can build one technique to

interact and explore the difference of batik patterns are packed in Virtual Reality.

II. METHOD

Normal Mapping is one of many methods to give depth impression texture and detail for object without many of polycount, so we can get efficiency of the computer work without loss of detail desired. The methods include stage Normal Mapping, Environment maps, bump maps, and shadow maps. There are several techniques that are used in the process of making batik texture for the 3D model, the method include, stage *Normal Mapping, Environment maps, bump maps, and shadow maps.*

A. Environment-Maps

Environment maps can be used in coloring with lots of images (textures) for record global reflections and lighting on the object. These images resampled during rendering process, with the aim to extract, and view specific information and applied as a texture on the geometric surface of the object.

B. Bump-Maps

Bump Mapping is one of the proposed solution to this problem where the surface normal of underlying geometry are allowed to vary per texture element. As a result, when the light is moved around the object, highlights appear due to the bump map and the surface appears to be rough, grooved or similarly modified as desired. Bump maps can be either hand modeled or more typically, calculated procedurally.

Bump maps are used to focuss on the texture of the surface's of objects, by using these maps, surface's object will look different and unique, unlike those objects which have a normal surface in general these maps is applied to field maps high indicate or low levels of object's surface, it will distrub the function of the object's normal surface, so that give rise to a unique impression when the results are rendered.

The result of this process, texture of object maps will be richer, and more detailed representation of the object's surface and more likely the natural surface.

C. Shadow-Maps

Shadow maps uses for perspective transform specified in light space which allows treating all lights as directional lights and does not change the direction of the

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light sources. To build texture of interior batik Gallery in a Shadow maps we used to generate an image texture on the object with the capturing silhouette's visible light source.

Shadow Maps are very often used by the developers of 3D graphics, because the resulting effect of the object is very realistic show, and due to the shadow of the existing light source. This concept was introduced by Lance Williams in 1978, in a paper entitled "Casting curved shadows on curved surfaces". Since then, this technique has been used both in the pre-rendered scenes, used in realtime, or even applied to many consoles and high-end gaming PC.

Furthermore Virtual Reality applications in batik design is done by moving the image format is an alternative option as well as other variations of image format into image, taken from the Journal A New Virtual Reality Environment Used for e-Learning, by Zhenbo Li (2009) method can be done with process diagram as shown 2.3.1.

Immersive Virtual Environment is a complex system. The arrangement consists of two parts, namely the design of virtual scene and determination of incidence (define event), because Virtual Environment is highly dependent on the object, and it is very important to the achievement of a 3D object. Much detail of an object will be affect and reduce, especially when the model is rendered via internet, for example by using VRML. This process renders the process always requires balance and detail of the object.

III. RESULT AND DISCUSSION

A. Implementation System for Virtual Reality

Normal Mapping used for the first step in making batik texture and character that will be virtualized. In the figure 7 describe human interaction experiments (Human Interaction system) for modelling 3D.

Based on journal of " I- Architect: A Virtual Reality CAD System (Randa T: vol 6 No 4 December 2011 IEEE). The system imports many libraries that implements different functionalities that we need to make our system flexible and to have it behave in such a desired manner. Figure 5 show the different main component and libraries in such a system. Some of these main libraries include:

- a. ControllIP5: is a GUI and controller library for processing that can be used in authoring, application and applet mode. In our system we used this library to build the two main windows, the controller sub menu and the VR environment landscape and their component buttons.
- b. Shape3D : this library provide a number of 3D primitive shape but enables simple creation of a 3D terrain and the user of controllable camera that can transverse over the terrain.
- c. Toxilib : this is the huge Library that contains a lot of branches such as audio , color , geometry , math, physics , image.
- d. PeasyCam : this is library provide a dead simple mouse driven camera for processing. making textures for walls and floors, the early stages are performed on the object plane and making a mess and then we scaled for primitive mess: (X : 10) (Y :

10) (Z : 10) with Rotation (X : 270) (Y : 0) dan (Z : 0)

The other wall we scaled: (X : 0.5) (Y : 10) (Z : 10) using Cube Mess (Mess Filter) and Mess rendered.

For the interaction of the system at the present time, the Graphical User Interface and 2D interactions equipment such as keyboards, mouse is very often used.

B. Texturing for Primitive Mess

Texturing for primitive mess enables greatly to improved realism over conventional methods, we used impression of geometric detail in a model using an image, for example, a photograph of wood may be used as a texture map on a planar surface to avoid modeling the complex surface detail of the wood. for wall and floor textures, we scaled primitive object: (X : 10),(Y : 10) (Z : 10) with rotation (X : 270) (Y : 0) dan (Z : 0)

C. Direction Light and Point Light

Direction lights are mostly used as a key light sunlight or moonlight in an outdoor game. Viewing distances can be huge, especially in first and third person games, and shadows often require some tuning to get the best quality with performance balance for your situation. Directional lights are used mainly in outdoor scenes for sun & moonlight. They affect all surfaces of objects in scene. They are the least expensive on the graphics processor. Shadows from directional lights (for platforms that support shadows) are explained in depth on a texture. We put on each side of the room lighting with directional and point light intensity with a range of different colors.

Point lights shine out from a point in all directions. They are the most common lights in computer games - typically used for explosions, light bulbs, etc. They have an average cost on the graphics processor (though point light shadows are the most expensive).

D. Camera Controller

Camera Controller used to control course of the application. Game Engine Unity3D software has facility camera controller to control nets to run applications , and it will be able to use the keyboard, joystick or the other output device. We can use facility of capsule object to execute actors such as forward and backward, while the Look X and Look Y and used to see objects or rotate around the area, such as left, right up , down at the rigidbody of camera's position. Freeze rotation used to stops with functionality object whose function to run actors such as forward and backward, while the look Y used by the camera to see the objects or rotate around the area, such as left right up down at the camera stops with functionality rigid body.

We can run the application using cursor on the keyboard for jump, walk and run . the otherway we can using joystick or mouse for controlling this application.

IV. CONCLUSION

Today preservation of batik in seems less developing, because the use of communication media tend to be monotonous, most of the media using photos and videos in preserving and documenting the work. In response, packaging and preservation work using virtual reality technology become one innovation to improve it. Normal mapping is one of many method to give depth. Impression texture and detail for object without man

of polycount, so we can get efficiency of the computer work without loss of detail desired. In this research we try to explain several techniques make batik Gallery design textures with modeling 3D, The methods include stage Normal Mapping, Environment maps, bump maps, and shadow maps. The next process we can use the direction Light and Point Light for each object to get the impression of depth and real dimension for each texture. Implementation design in VR we used Camera's Controller to control course of the application, using standard asset model in first person shooter (fps). To control of VR will be able to run applications and used keyboard, joystick or other output device.

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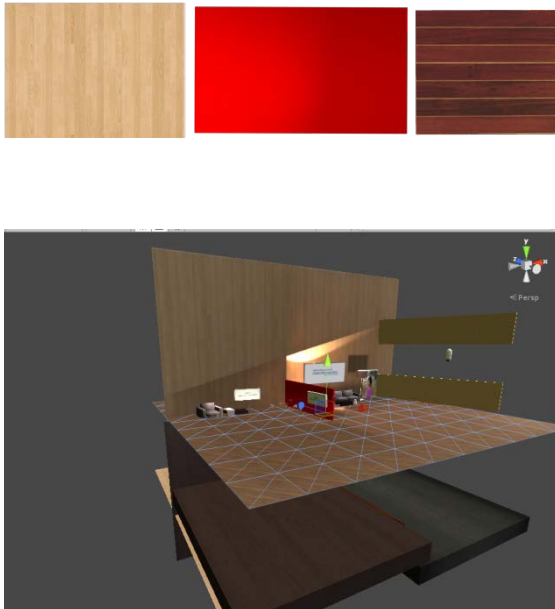


Figure 1. Texture image and 3D modell for environment map of batik gallery

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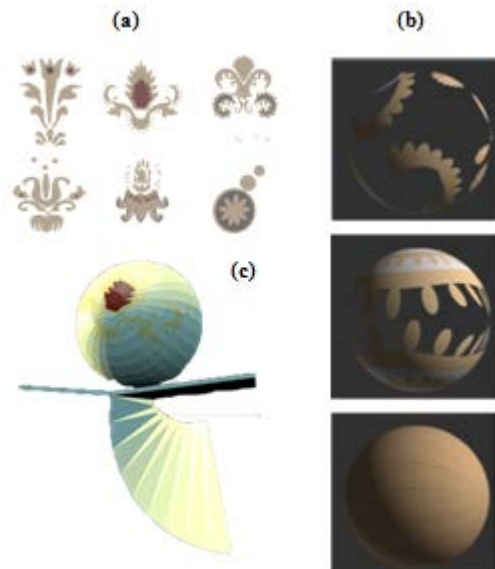


Figure 2. Texturing for pattern Batik
 (a) Batik design with vector format , (b) 3D modelling for batik Patterns (c) Normal Maps with photo texture and light effect

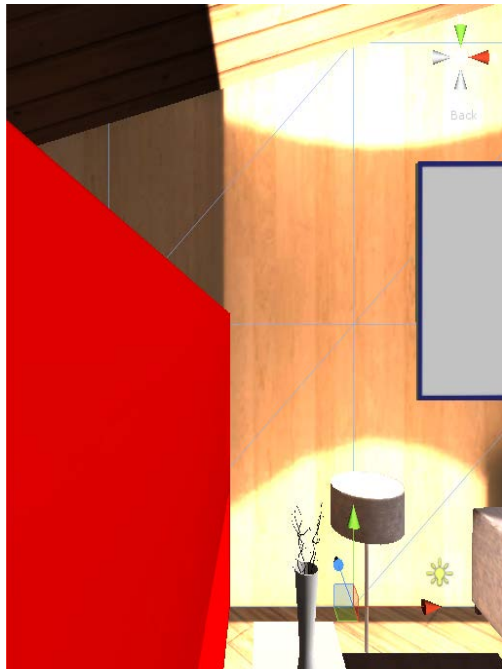


Figure 3. Shadow maps for environment design



Figure 6. 3D modelling for Batik Gallery

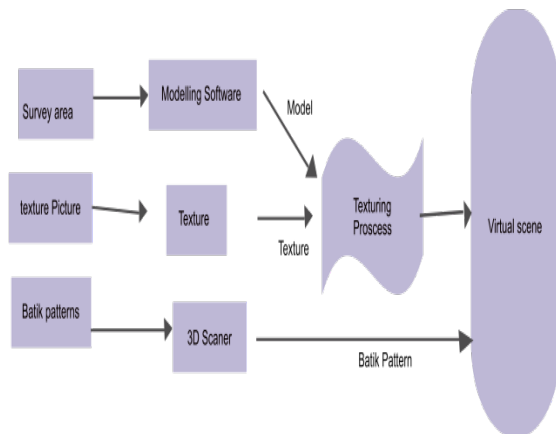


Figure 4. Framework of Virtual environments



Figure 7. Texturing for primitive mess

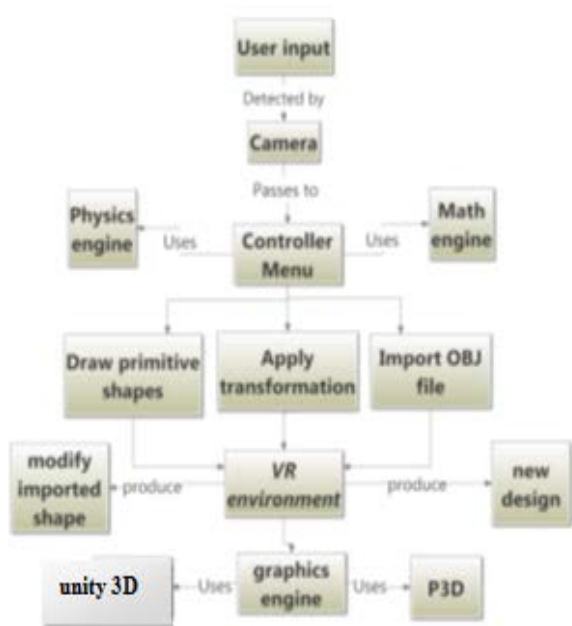


Figure 5. The Relationship Between the system's component

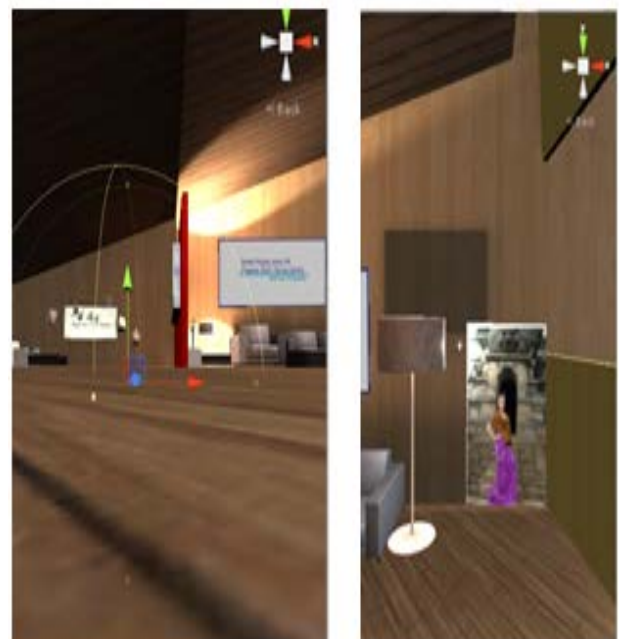


Figure 8. Directional light application in unity3D



Figure 8. Galery Design with keyboard Controller

TABEL 1
 APLICATION VR IN GAME ENGINE UNITY3D

Carracter Controller	Mouse Lock
Slope Limit: 45	axis
Step Offset: 0.4	Mouse X: 15
Skin Widht: 0.05	Mouse Y: Y
Min Move Distance: 0	Minimum X: -360
Radius: 0.4	Maximum X: 360
Height: 2	Maximum Y: 0
	Minimum Y: 0