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Character Designing with Visual Approach for Puppet Animation in A Hybrid Short Animation “Ihan”

Visualizing stop motion puppet figure in 3D animated characters



Abstract

Every animation media has their own uniqueness in terms of physical features in character designs. In stop motion animation, every character was produced by hand, resulting in some limitations in character creations that creates a unique physical features that differs them to digital animation. On the other hand, the animation process in stop motion animation takes a lot of time because every movement has to be captured frame by frame.

This paper aims to explain the process of designing characters for digital animation with stop motion animation as the visual approach, so that the designed 3D digital characters will have a unique physical features like characters in puppet animations, but the production time can be cut down for efficiency because the process was done digitally.

The output of the design will hopefully ease the character model and rig process in the next step.

Keywords: animation, character design, stop motion, 3-dimensional, visual

1 Introduction

Choosing an animation media that connects with the story is important before starting an animation production. IHAN short animation tells the story of Monang, bataknese boy who lived alone with his mother who was very sick. In the story, Monang will travel to the center of Toba Lake where he will have an encounter with Ihan, the mythical creature who lived there. For IHAN short animation, the production team agreed to use stop motion for the visual style because the background scene in the story is based on fact, which was near the Toba Lake in North Sumatera.

For the characters, the team agreed to use puppet animation style because based on reference studies, puppet animation is the most convenient media for humanoid and well-detailed

characters in stop motion. Characters in puppet animation were designed efficiently to ease the tricky animating process. On the other hand, animating puppets in stop motion is very time consuming and cost a lot, moreover it has some limitations in fast-paced movements [1].

To minimize limitations and optimizing production time, the characters for IHAN were made digitally in 3D while maintaining puppet animation characteristics. The design principal was based on literature and reference studies over some puppet animation shorts and feature films, so that the final output of the character design will portray some physical features of characters in puppet animations.

As the media for IHAN was considered a hybrid animation (combination of stop motion and 3D digital animation), this adds a unique challenge in terms of designing a concept for the character itself. The objective of the design is to produce a believable simulation of stop motion puppet in 3D software that can blend together with the environment that was made with different media. Instead of being able to express the character design with no boundaries in digital media, the designed digital characters in this research has to stick with some limitations as if it was made by hand, and this adds a unique aesthetic feels to the physical appearance of the character itself.

2 Design Process

The process of designing characters for Monang and Ihan was started by breaking down the characters from the story itself, followed by research in literature and direct observation. Creative process started by making thumbnail sketches of the face and body proportion to give a brief image of each character. This process went along with story development, so the character sketches were modified several times to adjust with the storyline. After the story was set, the character initial sketches had some adjustment starting from the features and body proportions. At this stage, some reference and literature study results for puppet animation character designing were applied to the design of each characters. Body proportion needs to be adjusted to match the final 3 dimensional characters.

After the body proportions and face features match the 3 dimensional character and portray the image of a character in puppet animation, next stage is designing the costume based on the references with the principal of costume designing for stop motion.

Color picking for the skin tone and costume for each characters were done based on their behavior and personality in the story, with analogous and complementary color harmony as a supporting theory. After everything was set, the final step is creating the character sheet which was the T-Pose for 3D modeling.

The detailed design process can be viewed in the following image in **Figure 1**.

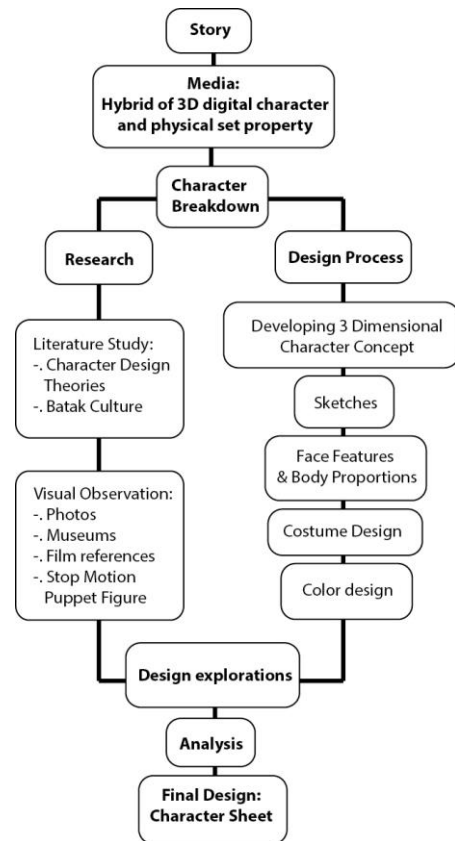


Fig.1 Design Process Flowchart

3 Three-Dimensional Characters

Before creating a visual sketch, determining the background story is required to design a strong character. A good character design is the one who could answer the 5W + 1H question, about who is the character, what does they do, when and where did they live, and most importantly is what is their purpose in the movie [2]. To be able to answer those questions, 3 dimensional character is the guideline to create a background story for character designs. The 3 principals in 3 dimensional character is physical, psychological, and sociological [3]. Physical is how the character physically appeared to the audience. Psychological is the character's behavior and personality. Sociological is the social background of the character; relationship with families and their surroundings.

A. Monang

Monang is a 13 year old bataknes boy who has a sincere heart, persistent and also everlasting love for his only mother. As a male in batak tribe and the backbone of the family, he has to work extra hard while taking over his mother's role because his mother is very sick. Because of those responsibilities, deep inside he has a hesitation and doubt before taking action. His personalities and attitudes are shown either in his physical features and his gestures in the movie.

B. Ihan

Ihan is a mythical creature that lived in the center of Toba Lake that takes a shape of a giant fish. Legend said that whoever has a sincere heart would be able to meet and have their one wish granted by her. Despite her huge and sturdy body, she has a gentle heart and not aggressive at all, as shown in her physical features, for examples in fins and tail.

4 Puppet Animation Aspects

Puppet animation is one of stop motion media that uses a puppet figure to tell stories as a character. Puppet animation was first introduced by Ladislav Starewicz in 1930, and is now becoming one of the most used media in stop motion feature films, such as Tim Burton and Laika Studio's films. In designing character for puppet animations, the main point is to design as effective as possible without leaving any unnecessary details [4]. There are also some important things not to be missed in designing puppet characters, such as armatures, face replacements and costume designing.

A. Armatures

Armature is the bone and joints for puppets. Armatures are necessary to ease the puppet's movement, and are designed based on the character's body proportions. A lean puppet body will make the armature small and simple, and will make the movement easier in animating process. In a more complex characters, armature will also be found on the puppet's face structures to help creating facial expressions. However, the downside of the facial armatures is the weight added to the puppet.



Fig.2 Armature in Puppet Animation of *Paranorman* (2012)
(http://1.bp.blogspot.com/-16C05Qm0aC8/UV83B1cZhrI/AAAAAABDq0/TFD_-ZZILsY/s1600/ParaNorman+stop+motion+puppet.jpg)

B. Face Replacements

Face replacements are the alternative to facial armature in terms of creating facial expression. In face replacement, each expression face models were 3D printed frame by frame, and to create an expression animation each face model has to be put on to the puppet per frame. The face models can be divided into two or more parts, such as eyes and mouth,

depending on the needs. Using face replacement technique will also create an unique aesthetic and characteristics to the puppet.



Fig.3 Application of Face Replacement Technique in *Coraline* (2009)

(<https://s-media-cache-ak0.pinimg.com/564x/79/cb/22/79cb224416cae65dedac4d1f6dd050db.jpg>)

C. Costume Design

Costume for characters needs to be designed based on the character's role on the movie. They also have to be in line with the background and time setting in the story, without forgetting the key point which is efficiency. Some research and studies needs to be done so the costume design, characters and background setting could be harmonized beautifully [5].

5 Character Analysis

A. Face and Body Proportion of Monang



Fig.4 Monang's Basic Shape Design

Following the 3 dimensional character that Monang has, he was designed with a lean body because of his economic background. Monang is formed from two basic shapes, which are circle and square. The circle can be seen in his head area to leave a gentle impression on his face, and the square figure can be seen from shoulder to his toe to show his masculinity. His face were designed based on a study upon some pictures

of Bataknese children, and modified adjusting his psychological aspects of three dimensional character.

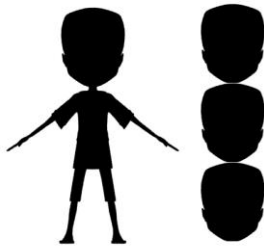


Fig.5 Monang's Body Proportion

His body was designed with 1:3 head proportion, meant to drive audience's attention to his face and to emphasize his young age. The 1:3 body proportion is also derived from Norman's body proportion from the movie *Paranorman*, which shows the average proportion of puppet figure in puppet animations.



Fig.6 Monang's Facial Features

The puppet animation aspects can be seen the most on his facial features. Imitating the face replacement technique, the upper and lower part of his face were divided into two parts, separated by a horizontal line along his face. Other puppet animation aspects can also be seen in his eye area, where his eyelids were designed separately from his face structures, because puppet figure's skin were sturdy and stiff so the eyelids wouldn't be able to blink properly. His eyelids were designed covering the eyeballs and were divided into two half circles on each eye.

B. Costume Design of Monang



Fig.7 Past Photo of Bataknese Tribe Costume

(https://upload.wikimedia.org/wikipedia/commons/thumb/e/e2/COLLECTIE_TROPENMUSEUM_De_Raja_van_Dolok_met_zijn_gevolg_Simeloengoen_TMnr_10001725.jpg/300px-COLL)

ECTIE_TROPENMUSEUM_De_Raja_van_Dolok_met_zijn_gevolg_Simeloengoen_TMnr_10001725.jpg)

Monang's costume were designed based on a reference study upon some pictures of Bataknese people in the past, with applying an efficiency principal to the design. That was the reason why his costume didn't have a lot of clothing piece and long fabrics, like most of Bataknese people wore back then. Animating long and flowing fabrics would be troublesome and time consuming. He also wears a knee-length short instead a sarong, because in the story he will be doing an extreme movement such as jumping and running, and using sarong will only limit his movement.



Fig.8 Monang's Turban

Monang wore a traditional Batak fabric named *ulos*. This was derived from a theory that said *ulos* were worn as a everyday clothes in the past [6]. In the design, the *ulos* design can be seen on his turban on his head.



Fig.9 Texture Detail on Monang's Clothes

Other aspect of puppet animation on his costume can be seen from the texture size of the fabric he wore. Costume for puppet figures was made and tailored from a human sized fabric, and there will be a huge ratio difference when the human sized fabric was worn by a small puppet figure. That is why the texture on puppet clothes appears larger than human clothes.

C. Color Palette for Monang



Fig.10 Monang's Color Palette

Red was the primary color for Monang, as seen on his turban design. The color red was chosen as a hope for Monang to be strong, brave and full of love. Based on analogous color harmony, secondary color for Monang was purple with a softer tone to balance the strong primary color. Soft purple was chosen to represent the kind-hearted side of Monang.

As for the skin tone, Monang has a medium yellow skin tone based on mongoloid tribe theory. Mongoloid tribes who lived in a highland tend to have brighter yellow skin tone than those who lived in the lower ground.

D. Face and Body Proportions for Ihan



Fig.11 Ihan's Basic Shape Design

The basic shape of Ihan's body consists of two shapes, which were circle and triangle. The circle shape was shown on her head area, while the triangle shape can be seen from her body and fin's shape. The shape circle was chosen to show the unity, gentle side of Ihan, and the triangle was meant to give an impression of action, conflict and wicked. Even though Ihan was also a protagonist in the movie, she was meant to look vicious and evil at the first glimpse.

Puppet animation aspects on Ihan's design were shown from her segmented and stiff body, which was derived from a fish pendant figure. Fish pendant figure was chosen as a reference for Ihan's body because of its sturdy surface and movement limitation that creates a puppet-like impression. Aside from body reference, their metallic texture were also chosen as a texture reference for Ihan.

E. Physical Features of Ihan



Fig.12 Ikan Jurung Figure

(<http://img.indonetwork.co.id/products/thumbs/600x600/2016/02/25/2adcb0c4c87006e7f4aa5482e9c969a4.jpg>)

The initial sketch and character concept for Ihan were derived from ikan jurung figure, an actual fish species that lives in Lake Toba. Based on myth and local rumors, ikan jurung was used for some essential ceremony in Bataknesse culture. It has a glowing body with a hint of pink or purple in color, one top fin and three fins on the bottom of its body.



Fig.13 Fin's Detail on Ihan

There is a difference in physical features on the actual ikan jurung body and the design of Ihan. On ikan jurung body, there are 3 fins located on the bottom part of the body. While on Ihan's design, the 3 fins were located on the upper body. This changes were done in order to match the design with the story. The fins wouldn't be visible in the movie if they were placed on the bottom part of its body, because in the story Ihan will be appearing on the water surface, which made only the upper body part will be visible in the camera.



Fig.14 Brass Fish Pendant

(<https://evintique.files.wordpress.com/2013/12/289.jpg>)

Puppet animation aspects on Ihan's design were shown from her segmented and stiff body, which was derived from a fish

pendant figure (**fig 14**). Fish pendant figure was chosen as a reference for Ihan's body because of its sturdy surface and movement limitation that create a puppet-like impression. In some countries, fish pendant was categorized as a jewelry, which was considered as a precious and valuable treasure. This statement match the 3-dimensional character of Ihan, who was a precious mythical creature of Lake Toba.

Aside from body reference, their metallic texture were also chosen as a texture reference for Ihan.

F. Color Palette for Ihan



Fig.15 Ihan's Color Palette

Color palette for Ihan was chosen based on her three dimensional character which was already determined before. The primary color for Ihan's color palette is yellow, because the color yellow give out the impression of wisdom. The golden yellow color on Ihan's body also symbolize majesty and power. Purple was chosen as the complementary color for Ihan, because purple give out the mystic and magical impression of a character.

6 Conclusion

Designing a character for hybrid animation adds challenge because it involves 2 different animation medias with different visual aspects. For IHAN short movie, the objective is to design the character that was made digitally to match the environment that was made by hand.

Some literature and reference studies need to be done in order to find the unique features in puppet animations and the background story of each character. For Monang as the human character, the study focused on humanoid characters and figures along with the literature of Batakese tribe culture to match his three-dimensional character aspect. Puppet animation was taken from the real puppet doll at first, and with that statement the study for the character Ihan was more focused in real life figure with puppet-like approach, such as sculpture and pendant with joints and limited movements.

The key point of designing character for puppet animation is to design the character as effective as possible, to ease the animating process later. Three dimensional character is also an important aspect in character design which should not be forgotten.

On the project itself, designing digital character with puppet animation approach had successfully shortened the animating process, instead of doing the animation by hand frame by frame. The characters designed for the IHAN short movie also have a unique physical features, unlike any other characters in

3D digital animations. With the help of lighting and animation techniques, the character in IHAN short movie had successfully blend in with the environment diorama which was created manually by hand.

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Fig.16 Screenshot of the movie "Ihan" where we can see clearly how the character (3D animation) is visually blending with the environment that was a miniature set/ diorama. This picture demonstrates how important this research is to achieve a believable stop motion puppet looks.

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