



West Papua Culture-Based Virtual Youtuber Avatar Design with animated rigging on live2D Cubism

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Abstract

Recent technological developments have opened up a golden opportunity for the world to see Papuan culture in Indonesia. Currently, virtual YouTubers are idols and brand ambassadors, but there are still no virtual YouTubers with West Papua's unique culture. The purpose of designing a virtual YouTuber avatar based on West Papuan culture is to create a virtual character that can represent West Papuan culture so that we can add alternative Indonesian YouTuber virtual characters, especially those with West Papuan aspect. is directed toward Papuan culture to national and international range. With its unique West Papuan culture, this character design mockup needs to be animated before entering the Youtuber's virtual world. Rigging or bone attachment animations are created in the Live2D Cubism Software and moved using face tracking technology in the Vtube Studio Software.

1. Introduction

The culture in West Papua is very diverse because of the many tribes that live there, but this is not known by people outside Papua. Cultural changes also occurred in West Papua which affected indigenous Papuans and migrants. These cultural changes include forms of addition acculturation, syncretism substitution, and others. (Anakotta et al., 2019)

Live streaming is becoming popular by showing their real appearance, but not with virtual YouTubers who display 2-dimensional or 3-dimensional avatars. Virtual YouTubers have become popular in East Asia since 2016 with their first talent being Kizuna Ai. (Lu et al., 2021)

Virtual YouTubers with West Papuan culture have yet to be found on virtual YouTubers that have been released and debuted. According to Joseph Eliza Lopulalan (2018) that there is a lack of knowledge and recognition of the social and cultural aspects of the Papuan people. From this problem, the authors found a solution by designing a West Papuan cultural-based virtual YouTuber avatar where this character uses a West Papuan identity as a creative medium to introduce West Papuan culture to Indonesian people in the National and International areas.

The character design was designed based on the physical characteristics of the Melanesoid race with dark skin and curly hair, typical Papuan motifs such as the Cenderawasih batik motif, body painting typical of the Biak people, and the Cenderawasih bird as a typical animal of West Papua, then implemented using Rigging and Face tracking techniques.

1.1 Literature Review

1.1.1 Similar research journals

1. Animated Video Design for the Launch of the Youtuber Virtual Channel "Ifure Channel" and its Promotional Media (Arisuwito, 2019) aim to design animated videos as a medium to launch a channel for young people aged 15-22. The method is to make a flowchart or timeline for making animation from the introduction such as background, problem formulation, design objectives, literature review, product launch of the YouTube virtual YouTube channel, and animation, and then enter the design with a visual communication strategy and media strategy. After that make a prototype, try it out then end with the final design.
2. Indonesian Kris Representation on Virtual YouTuber "Anya Melfissa" Visual Identity (William & Ratri, 2021), were analyzing character designs inspired by Indonesian culture and the causes of difficulties in finding the visual identity of a keris. The method is to reveal the representation of the keris in the character design of Anya Melfissa. She will use the visual text analysis method using Peirce's semiotic theory with a literature study followed by the theory of the three factors of anthropomorphism. The visual text analysis process begins with breaking Anya Melfissa's character design into visual identity parts which include representations, objects, and interpretants, then identifying each object as an icon, index, and symbol. This identification is then linked to a study of the keris literature so that conclusions can be drawn about how the keris is represented in Anya Melfissa's character design. The three-factor theory of anthropomorphism is then used to determine the reasons behind this representational relationship.
3. View-Dependent Formulation of 2.5D Cartoon Models(Fukusato & Maejima, 2021), this study aimed to create a simple framework for creating 3D-like motions specifically for 2D cartoons. The method for creating a 2.5-dimensional cartoon model is to separate the 2D part in the main view into two components: 3D space anchors and display-specific distortion, then estimate the position of the 3D and 2D space anchors using algorithm calculations. Another method is View-Dependent Control by giving the view control panel the viewpoint, then calculates the position of anchors (including depth values) and shapes in 2.5D space by combining a set of viewpoint data.
4. Infographic Animation Design In Changes Of The Form Of Garuda Figure In Indonesia (Wibawa & Putra, 2018), This research aims to create a visual communication medium related to the various manifestations of the form of Garuda in Indonesia so far. The method used is as follows:
 1. Preparation of data collection instruments
 2. Data collection
 3. Data analysis
 4. Process data analysis in the form of infographics.
 - a. Grouping data based on anatomy
 - b. Converts data in iconographic visual form
 5. Combining iconographic data into an animated infographic
 - a. Arrange the iconography in an animated sequence.
 - b. Merge animation sequences into one complete shape
 - c. Add captions to animated movies.
 - d. Adding accompaniment in animated films.

1.1.2 Related Theory

1. West Papuan Cultural Theory

Culture is a system that includes language, objects, music, beliefs, and community activities that contain a sense of togetherness and have a relationship with one another (Ananakotta et al., 2019). According to Clyde Kluckhohn and William Henderson Kelly in their book *The concept of culture*, the notion of culture is all living plans created historically, whether explicitly, implicitly, rationally, irrationally, or non-rationally, which exist at a certain time as a potential guide in human behavior.

2. Character Design Theory

The most important part of designing a character is the story and storytelling. a character will always refer to history or backstory. Any character you see will try to uncover the story behind that character because it is human nature to try to determine which archetype fits the character. It's certainly possible to draw characters without a story first, and most people do that all the time. The problem that arises when it's finished and you still want to use the characters that were designed is when the story doesn't match the characters, so you have to remake the story and adapt it to the characters you made. But animation that tells a story must have at least one protagonist speaking to the audience. Between the audience and the characters is very important, especially when the story is based on the characters themselves. If the audience finds traits that are similar to the character's, it will generally attract more attention. But when you create other characters, you don't need to pay attention to such things. For example, by forming an antagonist that can make the audience hate that character. (Tillman, 2011)

Design characters must pay attention to several details before, during, or after building a character as identity information from a character such as a name, nickname, age, height, weight, gender, birth origin, and eye color. Apart from the physical characteristics, the design of a character must be able to explain the nature and behavior of a character with only one look from a behavior that will show the nature, motivation, and background of a character.

3. Markerless Augmented Reality Theory

The Markerless Augmented Reality method is a method where users no longer need to print markers to display digital items. In this case, the recognized marker is in the form of position, direction, or device. (Herlambang, 2019)

The advantage of this method is that it makes markers more natural, this method also has several techniques used for its manufacturers, such as face tracking, 3d object tracking, and motion tracking. The drawback in the implementation of this method is that it uses a lot of feature points as markers, so when displaying virtual objects, these feature points must be fully detected by the camera.

The following are the techniques for Markerless Augmented Reality:

- a. Face Tracking = Using widely developed algorithms, computers can recognize human faces in general by recognizing the position of the human nose and mouth, then other nearby objects such as trees, houses, and other objects.
- b. 3D Object Tracking = In contrast to Face Tracking which only recognizes human faces in general, 3D Object Tracking techniques can recognize all forms of objects around, such as cars, tables, televisions, and others
- c. Motion Tracking = Motion Tracking in making animation is a technology for capturing or recording the action activities of human actors which will be output into digital models in the form of 2D or 3D animation. Performance Capture which means capturing subtle expressions and fingers, or other movement details. In this technique, the computer can capture motion, Motion Tracking has started to be widely used for films that try to simulate motion.

4 Definition of Avatars

An avatar is an instrument or mechanism that defines for participants a fictional agency and mediates a fictional agency; it is the embodied incarnation of the acting subject. It depends on the principle of the model and acts as a dynamic reflexive buffer about its environment. The term avatar is used to describe virtual simulations of humans in the metaverse or virtual reality applications on the internet. (Stephenson, 1992)

Avatars are used as incarnations of beliefs or philosophies, or in this case, God on Earth. So that when God came to Earth, their Avatar was their physical manifestation. (Garriott, 2010)

Avatar Capabilities and Limitations are based on the objective properties of the model, and these capabilities and limitations define the player's fictional agency space of possibilities in the game. Therefore, the avatar defines the boundaries of the embodied delusion. An avatar is an instrument or mechanism that defines for participants a fictional agency and mediates a fictional agency; it is the embodied incarnation of the acting subject. It depends on the principles of the model and acts as a dynamic reflexive buffer to its environment.

5. Culture Theory

According to Koentjaraningrat in his book entitled "Culture, Mentality, and Development" Many people misinterpret the concept of culture in a limited sense such as thoughts, works, and human works that fulfill their desire for beauty or it can be interpreted that culture is art, in that sense the concept is too much. narrow.

Social scientists interpret the concept of culture in a very broad sense, the totality of human thoughts, works, and creations that are not rooted in instinct and thus can only be sparked by humans after a learning process. The concept is very broad because it almost covers the activities of human life. Because the concept of culture is so broad, it is broken down into its elements. There are 7 elements of the concept of culture. (Koentjaraningrat, 2000) ; (a.) Religious system and ceremonies, (b) System and social organization, (c) Knowledge System ,(d) Language, (e) Art, (f) living livelihood system, (g) technology and equipment system.

6 Theory of the physical characteristics of race in Indonesia

According to Wallace (Wallace, 1890) in his book "The Malay Archipelago" describes the differences between the two races based on physical and mental as well as their resemblance to several other tribes.

Malay people. Basically, Malays are not handsome, but when they are teenagers they are very charming. (a) Skin Color are reddish brown and brownish yellow, (b) Hair are Black, straight, and a bit coarse (c) Not much body hair and often beardless. (d) Strong body with a broad chest, (e) The legs are small and short, (f) Same stature and smaller than Europeans, (g) Her hands are small and rather delicate, (h) The face is slightly wide and tends to be flat, (i) Slightly rounded forehead, (j) Thin and black eyebrows, (k) The look in his eyes is friendly, (l) Small nose, not sharp but straight. The nose tip is slightly rounded with wide nostrils, (m) Slightly protruding jawbone, (n) Mouth is wide, and the lips are thick but not monolog, (o) His chin is round.

Melanesoid people have (a) Skin color is brown and dark, some of their skin is blackish brown, (b) Hair is small curls, rough and dry, (c) Stature is bigger than the Malay race. Long and thin legs, (d) Face is oval, flat forehead, pointed eyebrows, (e) Nose is big, slightly crooked, and sharp. Thick nose bridge with wide nostrils, (f) Mouth is wide, lips thick and prominent.

According to the Big Indonesian Dictionary (KBBI) the word 'Ras' is a national group based on physical characteristics. However, 'race' can also be interpreted as coming from ancestors who have distinctive physical characteristics that are passed down from generation to generation. (Bestary, 2022)

There are 4 races in Indonesia, namely:

- a. Malayan-Mongoloid Race, can be found in Sumatra, West Nusa Tenggara, Java, Bali, and Kalimantan. Its main physical characteristics are large eyes, olive and brown skin color
- b. Melanesoid Race can be found in the regions of Papua, Maluku, and East Nusa Tenggara. His main physical characteristics are dark skin and curly hair.
- c. Asiatic Mongoloid race originates from China, Japan, and Korea. Its main physical characteristics are fair skin and slanted eyes.
- d. Caucasoid race comes from the United States, Europe, India, and Australia. Its main physical characteristic is a sharp nose with slightly yellow or white skin color.

7. Character-driven theory

Creating an interesting character will make it easier to make a good story about that character. The background or story of a character must be detailed in detail such as name, gender, place/date of birth/age, short origin, hobbies/special abilities, traits, weaknesses, and strengths. (Marupen, 2017). Some approaches to designing an interesting character are ; (a) Silhouette approach , (b) Color Approach, (c). How to stand / Posture / Gesture, (d) Costumes, (e) Unique, and (f) Keep it simple.

8. Color Theory

According to Marian L. David in her book entitled Visual in Dress (1987:119), colors are grouped into two, namely external and internal colors. External colors are physical and physiological colors, while internal colors are colors as human perception or the way humans see colors and then process them in the brain and how to express them. (Sulasmi Darmaprawira W.A, 2002)

Marian also describes colors as follows:

- a. Red: Courageous, Primitive, attractive, Love, strength, attractive, sin, viscosity.
- b. Orange Red: Passion, Energy, Strength, Fast, Awesome, Passion.
- c. Orange: extremist, attractive, young and warm spirit.
- d. Orange yellow: openness, happiness, respect, joy, optimistic
- e. Yellow: bright, wise, bright, happy, warm, cowardly, betrayal.
- f. Yellow green: young friendship, warm, new, restless, radiant.
- g. Light green: inexperienced, being jealous, envious, rich.
- h. Green: calm, relaxed, quiet, gentle, loyal, confident..
- i. Blue green: calm, relaxed, quiet, gentle, loyal, trust.
- j. Blue: peaceful, loyal, conservative, passive, respectable, depressed, gentle, restrained, sincere.
- k. Blue purple: spiritual, exhaustion, great, gloom, maturity, simple, humble, alienated, isolated, bright, serene.
- l. Purple: strong, majestic (noble), mystery, formal, supremacy, melancholy, quiet,
- m. Red purple : isolated, Motivator, pressure, drama, intrigue, puzzle.
- n. Chocolate: warm, calm, natural, friendly, togetherness, calm, serene, humble.
- o. Black: strong, mourning, official, death, craftsmanship, noerratic.
- p. Gray : calm
- q. White: spiritual, pure, happy, clean, bright, innocent, forgiving, Hope.

9. Rigging theory of animation

Rigging is a digital framework with 3D mesh, like a real framework, the rig consists of joints, controllers and skinning where the joint is the provision of joints to the framework after which the controller is made for the controller to move easily. Rigging is a combination of bones and character called skinning. (Slick. J, 2013)

Rigging in animation or digital puppeteer is the same as in traditional animation, there are 12 principles of animation which of course must be presented so that the resulting animation can look good. The difference is technical because using software requires knowledge such as how to take character assets, and move joints, as well as an in-between system that is automatically created by the software. (Johnston, 1981)

Here are 12 Principles of animation such as ; (a) Solid Drawing, (b) Timing and Spacing, (c) Squash and Stretch, (d) Anticipation, (e) Slow in and slow out, (f) Arcs, (g) Secondary Action, (h) Follow Through and Overlapping Actions, (i) Straight Ahead Action and Pose to Pose, (j) Staging, (k) Appeals, and (l) Exaggeration.

10. Female Lead Character Theory

Hayao Miyazaki has strong female characters in his films, with voices that grow independently and autonomy. Interestingly, however, the female characters in his films are often portrayed by Miyazaki in a non-binary position. One of the female characters in Ghibli films is Nausicaä of the Valley of the Wind, and through the role of Nausicaä, Hayao Miyazaki deconstructs the character of the princess, and addresses society's gendered expectations of women. Especially consolidate the image of the royal princess. Nausicaä is a portrait of female empowerment, a unique combination of individuality and femininity, evident in her calm and caring attitude towards nature, masculine in her mechanical skills, swordsmanship, and ability to pilot a jet engine. is. (Floretta, 2020)

Female characteristics are: Affectionate, Cheerful, Childish, Affectionate, Avoids harsh language, Eases hurt feelings, Feminine, Flattering, Tender, Gullible, Loves children, Loyal, Sensitive to the needs of others, Shy, soft-spoken, caring, kind, understanding, warm-hearted and spoiled. Male characteristics are: Leadership Qualities, Aggressive, Ambitious, Analytical, Assertive, Reflexive, Competitive, Standing for Your Own Convictions, Dominant, Strong, Leader, Independent, Individualistic, Makes Decisions Easily yielding, masculine, independent, strong, taking a stand and willingly taking risks. (Newman, M. G., Takei, H. H., & Carranza, 2002)

2. Research Methods

The research method used in this study was a data collection method (Emphatize), namely a questionnaire and document study. Then the design method is design thinking according to Hasso Platter with 5 stages namely empathize, define, ideate, prototype, and test.



Fig.1 Design Thinking (Hasso Platter)

The empathize stage begins with finding sources of research objects by collecting data through document studies and questionnaires. The define stage makes observations of data collection beforehand to get to know more related to the object of research. The ideate stage explores ideas based on observations data such as Bodystorming and Character design sketches. The prototype stage carries out the creation of the avatar character design of a virtual cultural YouTuber typical of West Papua, starting from making avatar models to the rigging animation stage the test stage is testing the YouTuber virtual avatar prototype with a technical test on this virtual avatar face tracking.

3. Result and Discussion

3.1 An overview of the avatar character designs typical of West Papua culture

In designing this character design, the designer aims to create characters that can represent the unique culture of West Papua, therefore the designer pays attention to the development and progress of the culture in West Papua in terms of its cultural identity.

The design of the character that has been designed has gone through quite good consideration, Her name is Erum Jaelynn, Nicknamed Erum, 20 years old, Female, 163 cm height, body weight 50 kg, from West Papua, which has Papuan native blood. her name has meanings which is Erum (Islamic) meaning 'Heaven', Jaelynn (English-American) meaning 'bird of light'. This makes Erum Jaelynn's meaning 'a bird shining in Heaven' which was inspired by the bird of Paradise with its nickname "Bird of Paradise" or "Bird of Heaven". Erum has a clothing design inspired by the wings and tail of the Cendrawasih bird, then has brown skin visuals, long curly

hair, wears a bandana with shell beads from the Cendrawasih crown, wears batik with Cendrawasih motifs and has body paintings typical of Papuan culture.

The design use Anime/Manga style according to the results of the survey. Gender Female in the character design is designed to be able to carry the role of Female Lead, Have a masculine nature with the spirit of a leader by becoming a virtual avatar of a YouTuber with the first West Papuan culture but still having a soft feminine nature. The character sheet is also designed to display the front, back, rear view without the robe, head, and hair so that the typical Papuan motifs can be seen on the character's clothes. Besides that, there is a pose to visualize one of the characteristics of a cheerful character. Other additional objects are the color palette and overall body painting motifs. Erum's character design is enough to create a unique silhouette, such as his curly hair and robe shaped like the tail of a bird of paradise. The body painting on Erum's feet and hands comes from the Biak people's carving patterns, in the form of spirals and curved lines, which mean waves from sea waves



Fig.2 The appearance of Erum Jaelynn

3.2 An overview of the rigging animated avatar typical of West Papua culture

Rigging animation design

implementing rigging animation on the Live2D Cubism application to move in real-time with Vtube Studio. Following are the stages of rigging to motion capture after designing the character designs:

a. Paatsuwake /Texture

Paatsuwake is the stage of separating body parts before the rigging process. It is used in preparation for applying bone or rigging.



Fig.3 Paatsuwake /Texture

b. Rigging

Rigging is a method of adding or securing bones to an animated character so that the character can move. This process is carried out on the Cubism Live2D application. The first thing the author does before making rigging is applying Mesh to objects manually or auto mesh. (Live2DCubism, n.d.)

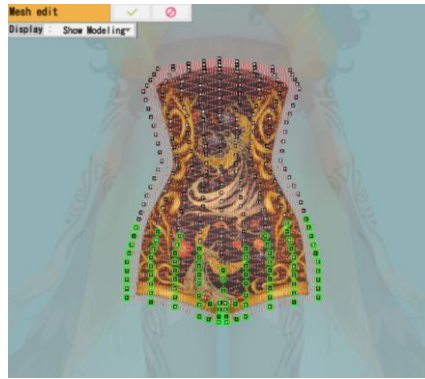


Fig.4 Warp deformers

The next step is to make a Deformer with 2 types, namely Warp Deformer and Rotation Deformer. Warp Deformer is applied to almost all objects while Rotation Deformer is only at certain points, such as:

- i. Chin = Head rotation
- ii. Neck = Rotation of the upper body
- iii. Waist = Waist Rotation or lower body
- iv. Arm joint = Arm Movement
- v. Elbow arm = Movement of the elbow
- vi. Wrist = Wrist
- vii. Thigh joint = Thigh Movement
- viii. Knee = Movement of the Knee to the calf
- ix. Ankle = Foot Movement

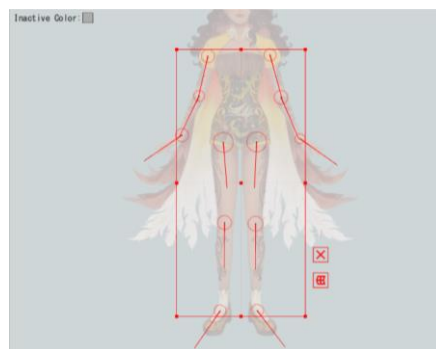


Fig.5 Rotation deformers

Then make a list of deformers appropriately so that the model being worked on doesn't move messy

The next stage is to make rigging with different Parameters with certain movements such as X, Y, Z, Form and Angle. This movement group will create other movements based on a combination of the X, Y, Z, Form and Angle movement groups. In addition, there is the application of the Laws of Physics to animate a movement.

1. X = Movement left and right

2. Y = Movement up and down

3. Z = right and left rotational movement

4. Form and Angle = Complementary movement to give the impression of jingle or bounce if it has been given physics or the laws of physics

c. Physics or Physical Laws

Physics is applied to several movement groups such as hair, bird of paradise tail, feathers on hair bands, eye flashes and shirt collars

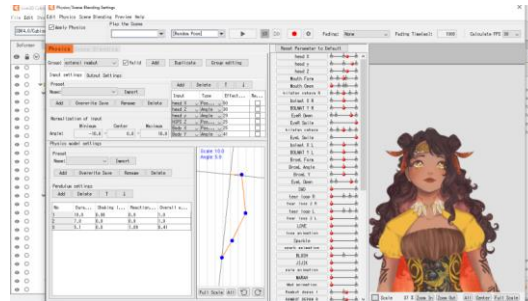


Fig.6 Physics

D. The following is a list of rigging features implemented:

1. Head XYZ

Head movement uses 3 parameters with a standard range from the Live2D software, namely -30.0 to 30.0 with a neutral point of 0.0.

a). The X move is the head turning $\frac{3}{4}$ to the right at -30.0 and $\frac{3}{4}$ to the left at 30.0.

b). The Y movement is the head looking down at -30.0 and looking up at 30.0.

c). The Z movement is the head leaning right at -30.0 point and the head leaning left at 30.0 point.

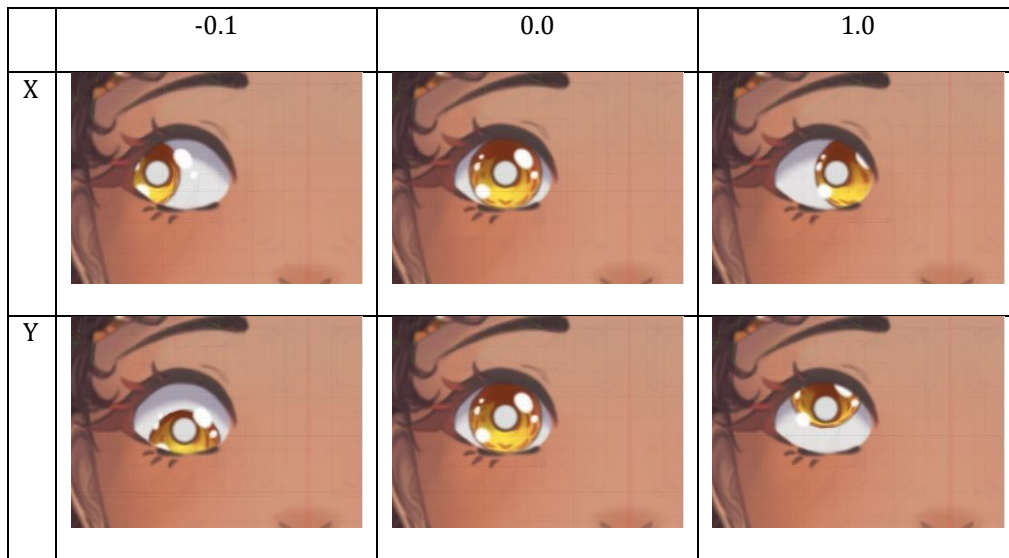
	-30.0	0.0	30.0
X			
Y			



2. Eyeballs

Eyeball movement uses 2 parameters with a range of -0.1 to 1.0 with a neutral point of 0.0.

- a) Movement X is the eyeball looking to the right at point -1.0 and to the left at point 1.0.
- b) The Y movement is the eyeball looking down at point -1.0 and up at point 1.0.



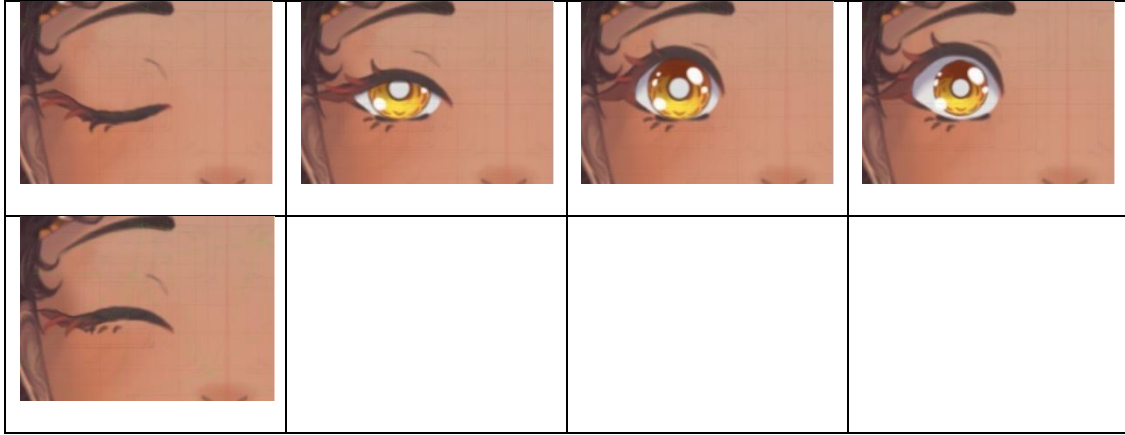
3. Eye Open

The movement of the eyelids is given a deform path edit so that the eyelids can be closed and opened.

eyelid movement uses 2 parameters with a range of 0.0 to 1.0 with a neutral point of 0.8.

- a) point 0.0 there are 2 movements, namely the eyelids are closed normally and the eyelids are closed with a happy expression
- b) point 0.2 there is a half-open movement of the eyelids
- c) point 0.8 there is a normal open movement of the eyelids
- d) point 1.0 there is movement of the eyelids that widen and the pupils shrink.

0.0	0.2	0.8	1.0
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4. Brows Y, angles and shapes

Rigging on the eyebrows uses 3 parameters with a range of -0.1 to 1.0 with a neutral point of 0.0.

- a) The Y movement is the eyebrow turning to the right at -1.0 and up at 1.0.
- b) The movement angle is the eyebrow tilted down left at point -0.1 and tilted down right at point 1.0.
- c) The movement of the form is the eyebrow in the form of a sad expression and to the right with a point of -0.1 and the eyebrow in the form of a surprised expression with a point of 1.0.

	<i>-0.1</i>	<i>0.0</i>	<i>1.0</i>
<i>Y</i>			
<i>angle</i>			
<i>form</i>			

5. Mouth open and form

Mouth rigging uses 2 parameters, namely Mouth Open (Y) with a range of 1.0 to 0.0 and Mouth Form (X) with a range of -0.1 to 1.0.

	-0.1	-0.5	0.0	0.2	1.0
1.0					
0.8					
0.5					
0.3					
0.0					

6. hair movements

The movement of the object's hair is divided into 4 parts, namely back hair, bangs, extension 1 and extension 2.

a) Back Hair

There are 2 parameters on the back hair, namely:

X : use the range -0.1 to 1.0. The movement is the lower back hair to the right at point -0.1 and to the left at point 1.0.

Y : use the range -0.1 to 1.0. The move is the elongated and shrunken lower back hair.

The combination of these two parameters produces a circular movement.

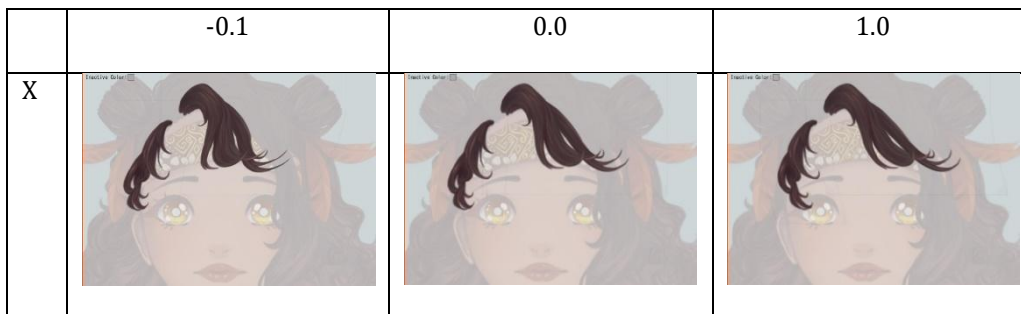
	-0.1	0.0	1.0
X			



b) Bangs

There is 1 parameter on the bangs, namely:

X : use the range -0.1 to 1.0. The movement is the hair to the right at point -0.1 and to the left at point 0.1.



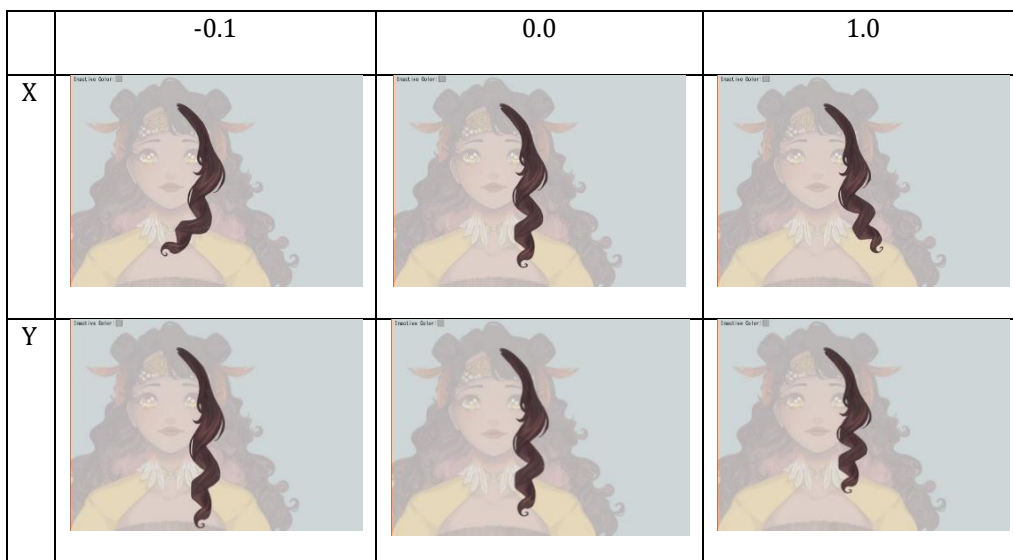
c) Extension 1

There are 2 parameters in Extension 1, namely:

X : use the range -0.1 to 1.0. The movement is 1 hair extension to the right at -0.1 point and to the left at 1.0 point.

Y : use the range -0.1 to 1.0. The move is hair extension 1 lengthening and shrinking.

Just like the back hair, the combination of these two parameters produces a circular movement.






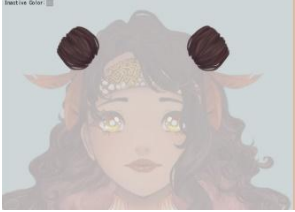
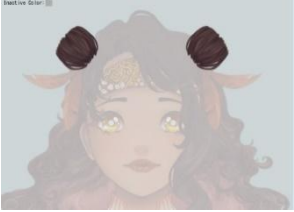
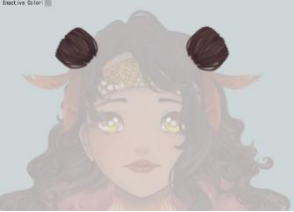
d) Extension 2

There are 2 parameters in Extension 2, namely:

X : use the range -0.1 to 1.0. The movement is 1 hair extension to the right at -0.1 point and to the left at 1.0 point.

Y : use the range -0.1 to 1.0. The move is hair extension 1 which is down and shrinking.

Just like the back hair and Extension 1, the combination of these two parameters results in a bouncing or jingle movement.

	-0.1	0.0	1.0
X			
Y			




7. Body XYZ

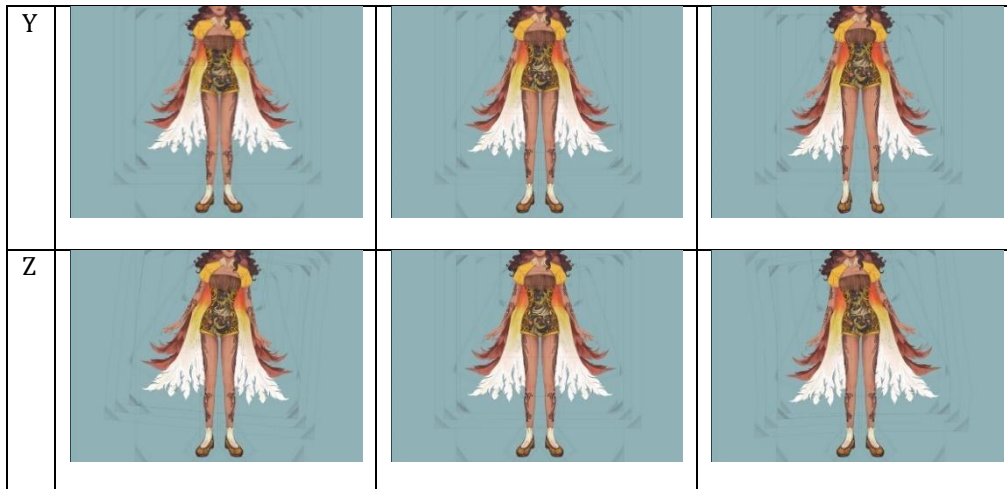
There are 3 parameters in body xyz namely:

X : use the range -10.0 to 10.0. The movement is that the body rotates $\frac{3}{4}$ to the right at -10.0 point and $\frac{3}{4}$ to the left at 10.0 point.

Y : use the range -10.0 to 10.0. The movement is a slightly bent body with knees together at -10.0 point and a slightly raised body with toes tiptoe at 10.0 point.

Z : use the range -10.0 to 10.0. The movement is the upper body leaning to the right at -10.0 point and to the left at 10.0 point

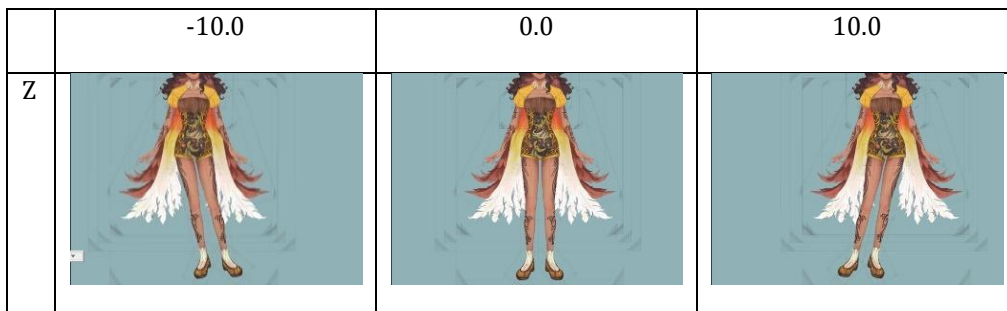
	-10.0	0.0	10.0
X			



8. Hips

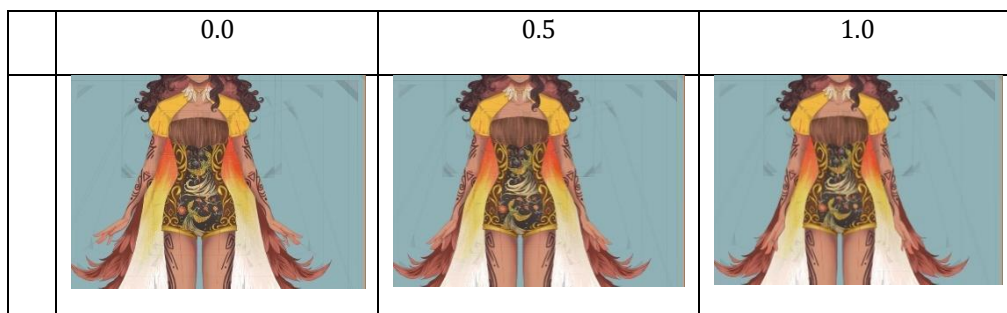
There is 1 parameter on the hips, namely:

Z: uses the range -10.0 to 10.0. The movement is a waist movement to the right at -10.0 point and to the left at 10.0 point.



9. Breathing

There are 3 parameters in breathing, namely by using the range 0.0 to 1.0. The movement is the body, shoulders and hands which decrease slightly at 0.0 and slightly increase at 1.0.









10. Clothing and Accessories

a. Collars

There are 2 parameters in the Collar, namely:

X : use the range -0.1 to 0.1. The movement is a collar to the right at -0.1 point and left at 1.0 point.

Y : use the range -0.1 to 0.1. The movement is a downward collar at -0.1 point and up at 1.0 point.

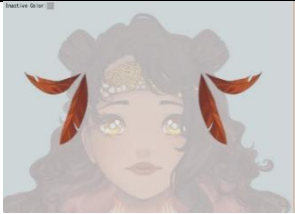
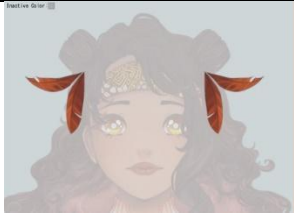
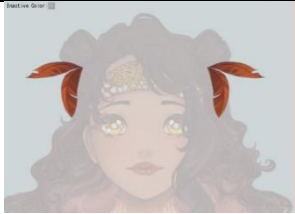
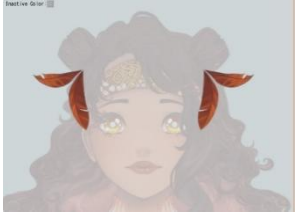
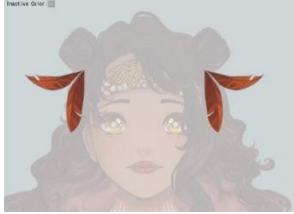
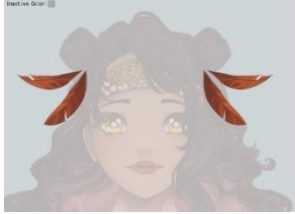
	-0.1	0.0	1.0
X			
Y			

b. Feathers Hair tie

There are 2 parameters in Feathers Hair Tie, namely:

Y : use the range -0.1 to 0.1. The movement is a hair band going down at -0.1 point and up at 1.0 point.

Form: use the range -0.1 to 0.1. The movement is a tuft of fur inward at -0.1 point and outward at 1.0 point.

	-0.1	0.0	1.0
Y			
for m			

11. Brown Tail There are 2 parameters in the Brown Tail, namely:

X : use the range -0.1 to 0.1. The movement is a brown tail that is to the right at point -0.1 and to the left at point 1.0.

Y : use the range -0.1 to 0.1. The movement is a brown tail downward at -0.1 and upward at 1.0.

Angle: use the range -0.1 to 0.1. The movement is an upward inner brown tail at -0.1 and an outer upward brown tail at 1.0.

Form: use the range -0.1 to 0.1. The movement was a brown tail that thickened at the -0.1 point and thinned out at the 1.0 point.

Angle and Form movements will produce jingle or bounce effects if given the laws of physics.

	-0.1	0.0	1.0
X			
Y			
Angle			
Form			

12. White Tail

There are 2 parameters in White Tail, namely:

X : use the range -0.1 to 0.1. The movement is a white tail going right at point -0.1 and left at point 1.0.

Y : use the range -0.1 to 0.1. The movement is a white tail downward at -0.1 point and upward at 1.0 point.

Angle: use the range -0.1 to 0.1. The movement is an inner white tail upward at -0.1 and an outer white tail upward at 1.0.

Form: use the range -0.1 to 0.1. The movement was a white tail that thickened at -0.1 point and thinned out at 1.0 point.

Angle and Form movements produce jingle or bounce effects if given the laws of physics

	-0.1	0.0	1.0
X			
Y			
Angle			
Form			

13. Breasts

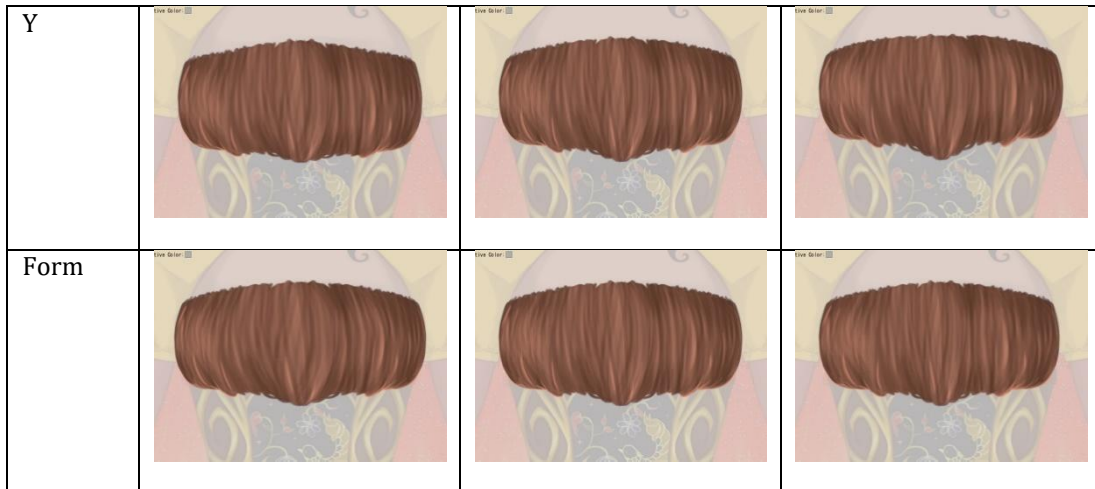
There are 2 parameters in the breast, namely:

X : use the range -0.1 to 0.1. The movement is the chest to the right at point -0.1 and to the left at point 1.0.

Y : use the range -0.1 to 0.1. The movement is chest down at -0.1 point and up at 1.0 point.

Form: use the range -0.1 to 0.1. The movement is the chest expanding at -0.1 point and converging or contracting at 1.0 point.

	-0.1	0.0	1.0
X			



14. Expression Sticker

There are 8 kinds of WhatsApp stickers designed for Erum, expressing love, sparkling, pale, angry, blush, happy, shock and sad.



Figure 7 Love and Angry Expression

E. Testing in Vtube Studio motion tracking

Face tracking in making animation is a technology for capturing or recording the action activities of human actors which will be output as digital models in the form of 2D or 3D animation.

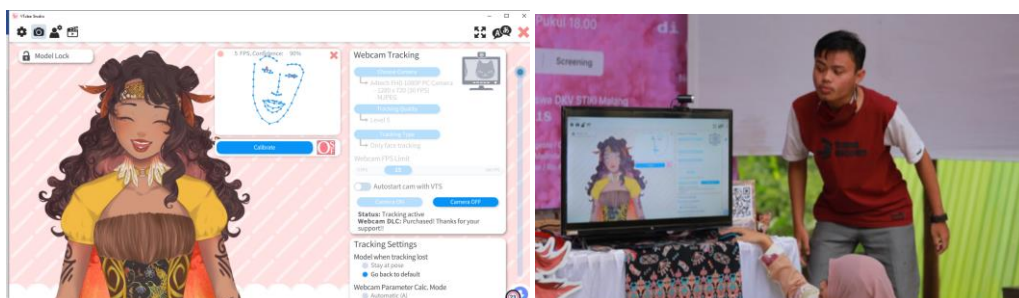


Fig.8 Face Tracking test

4. Conclusions

The design of the virtual YouTuber avatar character with West Papuan characteristics produces a character with the name "Erum Jaelynn" which comes from Erum (Islamic language) which means 'Heaven' and Jaelynn (English-American) which means 'bird of light'. This makes Erum Jaelynn's meaning 'a bird shining in Heaven' which was inspired by the bird of paradise with its nickname "Bird of Paradise".

The face tracking test was also carried out together with this character design test on the people of West Papua and as many as 62 visitors to the exhibition responded positively to aspects of satisfaction and aspects of the continuity of elements typical of West Papua.

Media development in the form of various visual communication media is certainly needed to further introduce and strengthen the figure of this West Papuan YouTuber virtual avatar, so that it can synergize with various government programs related to strengthening national character in Indonesia's young generation..

5. References

- Anakotta, R., Alman, A., & Solehun, S. (2019). AKULTURASI MASYARAKAT LOKAL DAN PENDATANG DI PAPUA BARAT. *Jurnal Antropologi: Isu-Isu Sosial Budaya*, 21(1), 29. <https://doi.org/10.25077/jantro.v21.n1.p29-37.2019>
- Arisuwito, N. D. (2019). *Perancangan Video Animasi Untuk Peluncuran Kanal Virtual Youtuber "Ifure Channel" Beserta Media Promosinya* [Universitas Ciputra]. <https://dspace.uc.ac.id/handle/123456789/3367>
- Ayoe, Yoeni Syafitri Sekar Ratri, D. D. M. (2021). *Natural Banget Aktingnya, Zsa Zsa Utari Ternyata Bukan Orang Asli Papua*. Suara.Com. <https://www.suara.com/entertainment/2021/03/05/174026/natural-banget-aktingnya-zsa-zsa-utari-ternyata-bukan-orang-asli-papua>
- Bestari, N. (2022). *Macam-Macam Ras di Indonesia, Ada Ras Melanesia Hingga Kaukasia*. Bobo.Id. <https://bobo.grid.id/read/083360387/macam-macam-ras-di-indonesia-ada-ras-melanesia-hingga-kaukasia?page=all>
- BirdLifeInternational. (2012). *Paradisaea apoda*". IUCN Red List of Threatened Species. Version 2013.2. *International Union for Conservation of Nature*.
- Floretta, J. (2020). Film-film Hayao Miyazaki dan Representasi Kepemimpinan Perempuan. *Women Lead by Madlene*. <https://womenlead.magdalene.co/2020/12/18/miyazaki-film-anime-jepang-ghibli-karakter-perempuan-keren/>
- Fukusato, T., & Maejima, A. (2021). *View-Dependent Formulation of 2.5D Cartoon Models*. <http://arxiv.org/abs/2103.15472>
- Garriott, R. (2010). *COINING TERM "AVATAR"*.
- Herlambang, H. (2019). Implementation of Augmented Reality Technology at Game Logic Using Cylindrical Object Tracking [UNIKOM]. In *Perpustakaan Pusat Unikom*. <https://elib.unikom.ac.id/gdl.php?mod=browse&op=read&id=jbptunikompp-gdl-hilmanherl-35925&q=markerless augmented reality>
- Ipul, D. (2018). *5 hal tentang Papua yang mungkin kamu belum tahu*. <https://daenggassing.com/cerita-ringan/5-hal-tentang-papua-yang-mungkin-kamu-belum-tahu-2/>
- Ipul, D. (2021). *Perbedaan Kecil Papua dan Papua Barat*. <https://daenggassing.com/perjalanan/papua/beda-papua-dan-papua-barat/>
- Johan. (2019). *Mengenal Arti Ukiran yang Ada di Tubuh Suku Asli Biak*. <https://indonesianew.com/2019/07/03/mengenal-arti-ukiran-yang-ada-di-tubuh-suku-asli-biak/>
- Johnston, F. T. and O. (1981). *The Illusion of Life: Disney Animation*.
- Koentjaraningrat, R. M. (2000). *Kebudayaan, mentalitas dan pembangunan*. Penerbit Djambatan.
- Kompas.com. (2011). *Memopulerkan Ukiran Biak*. <https://bola.kompas.com/read/2011/01/28/04081241/Memopulerkan.Ukiran.Biak?page=all>
- Live2DCubism. (n.d.). *What is Live2D? - How to Make & Use a Live2D Model*. <https://www.live2d.com/en/>
- Lopulalan, J. E. (2018). Jati diri orang asli papua dalam pusaran otonomi khusus di Provinsi Papua Barat. *SOCIA: Jurnal Ilmu-Ilmu Sosial*, 15(1), 37-49. <https://doi.org/10.21831/socia.v15i1.20801>
- Lu, Z., Shen, C., Li, J., Shen, H., & Wigdor, D. (2021, May 6). More kawaii than a real-person live streamer: Understanding how the otaku community engages with and perceives virtual youtubers. *Conference on Human Factors in Computing Systems - Proceedings*. <https://doi.org/10.1145/3411764.3445660>
- Marupen. (2017). *Cara membuat karakter desain yang baik*. <http://www.marupen.net/2017/09/cara->

- membuat-karakter-desain-yang-baik.html
- Newman, M. G., Takei, H. H., & Carranza, F. A. (2002). *Carranza's clinical periodontology*.
- Nurhaisah, Y., Finaka, A. W., & Devina, C. (2021). *Motif batik Papua beragam dan kaya makna*. Indonesia Batik.Id.
<https://indonesiabaik.id/infografis/motif-batik-papua-beragam-kaya-makna>
- Slick, J. (2013). *What is Rigging?* <http://3d.about.com/od/Creating-3D-The-CG>
- Stephenson, N. (1992). *Snow Crash*. BANTAM DELL.
- Sulasmi Darmaprawira W.A. (2002). *Warna : Teori dan Kreatifitas Penggunaanya*. ITB PRESS.
- Tillman, B. (2011). *Creative Character Design*. <https://doi.org/10.1016/B978-0-240-81495-7.X0001-3>
- Wallace, A. R. (1890). *MALAY AKCHIPELAGO*. MACMILLAN AND CO.
- Wibawa, M., & Putra, N. P. (2018). *INFOGRAPHIC ANIMATION DESIGN IN CHANGES OF THE FORM OF GARUDA FIGURE IN INDONESIA*.
- Widiastuti, H. (2021). *Mengenal pakaian adat dari Papua, ciri khas dan fungsinya*.
<https://kids.grid.id/read/472930844/mengenal-pakaian-adat-dari-papua-ciri-khas-dan-fungsinya?page=all#:~:text=Rok rumbai terbuat dari rajutan,bahan utama membuat rok rumbai>.
- William, D., & Ratri, D. (2021). *IMOVICCON 2021 Proceeding 200 Indonesia Kris Representation on Virtual YouTuber "Anya Melfissa" Visual Identity*.