



FINAL YEAR PROJECT
“Advanced Texturing Technique with Different 3D Software”

FINAL YEAR PROJECT REPORT

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Bachelor of Science in Multimedia and Creative Technology

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APPROVAL

This Project titled “**Advanced Texturing Technique with Different 3D Software**” submitted by **Mariam** to the Department of Multimedia and Creative Technology, Daffodil International University, has been accepted as satisfactory for the partial fulfillment of the requirements for the degree of B.Sc. in Multimedia and Creative Technology and approved as to its style and contents. The presentation has been held on **29th November 2018**.

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I hereby declare that, this project has been done by me under the supervision of **Mr. Arif Ahmed, Associate Professor, Department of MCT** Daffodil International University. I also declare that neither this project nor any part of this project has been submitted elsewhere for award of any degree or diploma.

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Finally, I must acknowledge with due respect the constant support and patients of my parents.



ABSTRACT

Now a days Animated series becoming popular among all types of people. Today it takes an important place in the job sector. Where internationally the popularity increases day by day. In 3d sector, the working pipeline divided the work from sketching to final output. In the meantime, it divided into Modelling, Unwrapping, Texturing, Rendering, Animation, Simulation, Dynamics etc. Where Texturing plays an important role in CGI industry. Without advanced texturing a super beautiful model could not express itself.

The purpose to choose this project, as my interested sector is 3D and to give the realistic feel of 3d either I have to modelling details which make high polygons and hard to cope up with work. Nor can assign advanced texturing which easy to work and low polygon-based object. In the project, how Character grow and build up the texture, the working pipeline will show details about the 3d generation and differentiate between the software's. The final outcome of this project is polished 3D character with different texturing appearance created by two/ three 3d software has been examined keeping relevant variables unchanged. It is found that the quality of texturing varies with respect to selection of different 3d software. The findings may assist 3d Modelers for choosing a 3d software for using texturing as per their needs. This project will create further opportunity to investigate texture mapping, normal mapping, shaders UV map unwrap, and bump map using different 3d software's. Autodesk 3ds max and Autodesk Maya used for Modelling, Substance painter and Autodesk 3ds max used for Texturing. Autodesk 3ds max used for final rendering.



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Appendix A: Gantt-Chart illustrating progress

Appendix B: DVD / USB files

Appendix C: Storyboard of rendered video



1.INTRODUCTION

Chapter 1

1.1 Introduction

“3D Modelling, Texturing, and Rendering are for the most part to a great degree. well known these days in light of the fact that, such innovations are winding up always accessible at this point. Formation of 3D models is a significant troublesome and meticulous process, in view of utilizing of expert projects for 3D model creation. Authenticity of the completed model relies upon surface for materials advancement and the plain procedure chose.

This report displays a point by point review of Texturing. Fundamental standards, points of interest, downsides and using different software which are displayed. The vital issue of 3D surfaces combination is contemplated with a specific thoughtfulness regarding scientific techniques and additionally physical-based models that can give intriguing answers for this issue.”

1.2 Goal

The goal of this project is to create a step-by-step guide for creating 3D character with advanced texturing by various texturing software so that the texture come out and can differentiate by the Texture of that specific software. The report portrays each progression from the production of the reference pictures to 3D modelling the character in 3ds Max, Autodesk Maya, Substance Painter, with various 3d software. The report additionally clarifies how the completed 3D model can be unwrapped, finished and arranged for activity. Each progression is clarified in detail so the modeler could make their own 3D character close by the guide.

Each activity and fast key utilized in various 3d software’s is clarified so the reader can repeat the procedure without outside help. The project is aimed for individuals who have probably some information of how 3d virtual products functions however a section on the simple nuts and bolts of various texturing instead of creating high poly model. which is incorporated for those are the fledgling of advanced 3d Industry and just have foundation in 3D programs like 3DS Max or Maya.



Character model will be made for instance yet the focal point of the venture isn't on making a cleaned character. Rather, the objective is to clarify the procedure so another person could make their very own character utilizing the report as a guide. It will clarify how character display was made while bringing up territories where issues emerged and how the said issues could be kept away from in future characters, Where the point of the theory is very broad.

1.3 Target Audience

CGI and 3D, One visual impacts style and one trick.

Today everybody is seriously pulled in to 3D activity. Also, it appears by the movies results. 3D, A three-dimensional film is a motion picture that creates a profundity recognition illusion, 3D goes as far back as films themselves, the style was prominent for sci-fi, dream, and beast motion pictures of the time. This prompted the negative undertone of 3D as a trick intended to excite lowbrow crowds. 3D again left style for a period.

The popularity of the films day by day increasing among all categories people. It becoming favorite not only children but also in elders. So here the targeting people is the animated film lovers and their percentage is uncountable as we know. CGI or Computer-generated imagery Realistic 3d with VFX can snatch away audience mind into natural true environment.

Pixar started in 1979 as a division of George Lucas's corporation. Throughout its history, Pixar has built up a notoriety for developing the absolute most capable specialists and PC engineers. Past specialized accomplishments, Pixar preparations reliably rank on the arrangements of most astounding earning and fundamentally commended movies. The studio has won 15 Foundation Grants, and two of its movies were named for Best Picture.

1.4 Gantt Chart (Timeline)

Project work had divided into time and date, according to the specific schedule project come out to it finalize output. A Gantt diagram is a kind of bar chart that delineates a venture schedule. This outline records the errands to be performed on the vertical hub and time interims on the level axis. The width of the flat bars in the chart demonstrates the length of each activity. Gantt graphs show the begin and complete dates of the terminal components and synopsis components of an undertaking. Terminal components and rundown components establish the work breakdown structure of the venture. Present day Gantt diagrams additionally demonstrate the reliance connections between exercises.

Table 1.1: Gantt Chart of my working pipeline.

<i>Phases</i>	Week 1	Week 2	Week 3	Week 4	Week 5-7	Week 8-9	Week 10
Idea Generating							
Plan							
Sketching							
Modelling							
Unwrapping							
Texturing							
Improvement							
Lighting							
Rigging							
Rendering							
Composition							



2.THE PROCESS OF 3D CHARACTER CREATION

Chapter 2 LITERATURE REVIEW

2.1 Introduction

Texturing is imperative for the sensible rendering since it includes surface points of interest that are generally too complex to be in any way demonstrated specifically. Regular 2D surface mapping remains the most normal way to deal with texture, specifically for ongoing applications. In any case, there are some real disadvantages inborn to this methodology: the twisting and the irregularity of texture. 3D texturing has been acquainted with PC designs to determine these issues.

2.2 3D and 3D Texturing

3D defines-Three dimensional and 3D Texturing defines- A picture or thing in a frame that gives an impression of being physically present with an assigned structure. Basically, it permits things that seemed level to the human eye to be show in a shape that takes into consideration different measurements. These measurements incorporate width, profundity, and stature.

Texturing is the procedure of making a reasonable 3D display, the way toward making and applying surfaces to a three-dimensional model. It gives the high detail into the surface. Texture is a variety of shading. Texture come in various configurations; this can be RGB surface, Greyscale surface, surface with alpha channel, monochrome surface and numerous others. Height map, bump map, normal map, displacement map, reflection map, specular map, occlusion map is the map where details assigned individually to makes 3D.

2.3 Importance of 3D Texturing in Industry

A texture artist creates a pipeline and match up the pipeline compare with the real footage. So that the reality and the virtual made less differences. He should have the knowledge about texturing



software's, as there are lots of texturing software's. but he has the knowledge about approximately render time, quality, interface, spontaneously library etc.

In Film industry Texturing can play significant role on 3d Character. Without texturing modelling is nothing in industry. If we observe the Blockbuster 3d Film, then we can find out their super realistic texture. Like Big Hero 6, Transformers, Avatar, Jurassic park etc.

On the basis of skills 3d can divided into three categories-

- Beginner--(According to texturing) Assign the map into surface and set it on based on shape.
- Advanced--(According to texturing) Advanced texturing is a process which involves different kinds of maps applied to a 3D model that give it color, details, shininess and other properties. That kind of texturing can be done in many different ways depending on the needs and possibilities of the particular project. **“Andrija Bernik, 2014”**
- Professional/Expert--(According to texturing) Need More details working pipeline than advanced texturing.

By texturing virtual object get the real impression of model in human eye. Which is more logical and pleasant to see in front of audience and thus audience are more afflicted by Animated movie.

2.5 Texturing Software's

Texturing reduce the render Timeline by low poly model instead of High poly model. There are lots of Texturing Software and texture artist use like Blender, Substance Painter, Photoshop, Mari, Zbrush, Body Paint 3D, Armory paint, Paint Club, DDO, Substance Designer, Sculptris, Mudbox, 3D-Coat etc.

2.6 Modeling

3D modeling is a technique where a object or model or character create by computer generated software. Modeler manipulate points to create mesh. By collection of vertices object made. 3D Modeling is a three-dimension images which is virtually set up on 2D surface. It consists of vertices, edges and polygons. There are three ways of model create: Polygonal modeling, curve modeling, Digital Sculpting etc.



- Polygonal modeling--Points in 3D Space, called vertices which are connected by edge to form polygon mesh.
- Curve modeling— Surfaces are defined by curves which can control.
- Digital sculpting—where model create by sculpt from clay and give the shape easier than using others tools.

2.7 Character Design

A character designer makes the whole idea, style, and storyboard of a character from lots off scratches. This regularly make the character's identity to build up a visual thought of the character's physical characteristics. Making a whole character from scratch need a working pipeline. That is the reason the procedure of character building is exceptionally hard and takes lot of time.

2.7 Unwrapping

On 3D object, texture into map firstly flatten 3d object into 2D space it is called UV unwrapping. Here UV refers 2D Coordinates where the texture assign into a 3d model. The U Coordinate represents the horizontal axis of the flatten map and The V Coordinate represents the vertical axis of the flatten map. After completing the model easier way for unwrapping is apply the projection mapping.as Planner, Cylindrical, Cubic, Spherical map which depends on the shape. Have to be careful on seam placement.

2.8 Texturing

Texturing defines- A picture or thing in a frame that gives an impression of being physically present with an assigned structure. Basically, it permits things that seemed level to the human eye to be show in a shape that takes into consideration different measurements. These measurements incorporate width, profundity, and stature.



Texturing is the procedure of making a reasonable 3D display, the way toward making and applying surfaces to a three-dimensional model. It gives the high detail into the surface. Texture is a variety of shading. Texture come in various configurations; this can be RGB surface, Greyscale surface, surface with alpha channel, monochrome surface and numerous others. Height map, bump map, normal map, displacement map, reflection map, specular map, occlusion map is the map where details assigned individually to makes 3D.

2.9 Lighting

Lighting where the real magic happens. The main purpose to use light is naturalistic the scene where object present and illuminate them properly. Where the excellent model, well placed texture, clever rigging, good animation, and realistic lighting make the project impressive. There are three types of lighting,

- 1 Point Lighting—Here use 1 light to illuminate the scene where no appreciable fill light is present.
- 2 Point Lighting—Use 2 Light Source present in the scene.
- 3 Point Lighting—Here 3 Light source uses , one is key light,another fill light and lastly back or rim light.

2.9 Rendering

Rendering is the procedure where the image output from Two Dimensional or Three Dimensional Object. In the frame ,render contain the geometry, light, texture, to study frame details information. There are two types of rendering- Pre Rendering and Real time Rendering.,

- Pre rendering- It's not connected with speed. it's the procedure where the video is recording but not rendered in real time by computer hardware configuration. just playing back the video.
- Real time rendering- Displaying the video as it as realistically. Where mostly it use in animation.by how the animation will go on in real view.It requires the graphics system to render the output fast.



There are various categories of render engine such as Arnold, Vray, Corona, Iray, Indigo, Mental ray, Maxwell, Keyshot etc. Scanline, Raytracing, Global Illumination etc are the methods of Rendering.

2.10 Final output

The Final output of this project is to define the process how the character get realistic texture which seemed to human eye naturally also show the phases and uses of different software which to execute for unwrapping various map and texture. Here also show the different character build up steps. High polygon character takes much time for rendering instead of low polygon. Define the reason of using various maps like diffuse, Specular, Glossiness, Roughness, Normal, Bump etc

2.11 Conclusion

The making of a 3D character is an intricate procedure, comprising of different stages, each requiring specific aptitude and abilities. Subsequently, it is no big surprise that the procedure is regularly partitioned among various experts, every one talented in their particular specialization.

Also, as 3d preparations become greater and more eager, new advancements and techniques are continually created to improve the visuals of recreations. With the end goal to remain on the bleeding edge of diversion development, specialists need to continually learn new standards and strategies, and in addition the instruments that accompany them. Fortunately, present day instruments are frequently more natural and productive, making it simpler for artists to learn and utilize them, and making the substance creation quicker and more effective. Likewise, as equipment gets up to speed with the requests of recreations' visuals, specialists are progressively liberated from the limitations set by the computational intensity of gadgets, taking into account more inventive opportunity.

Be that as it may, this does not dispense with the need to initially take in the essentials, such as seeing how different parts of 3D models and textures influence the execution of diversions, and what the basic standards of various strategies and innovations depend on. Not with standing the



advances in innovation and instruments, the formation of amusement characters still remains a huge and convoluted process, and the measure of mastery and ability it requires can show up particularly overwhelming to little improvement groups, or individuals wishing to enter the 3d business.

3.THE STRUCTURE OF A GOOD CHARACTER MODEL

Chapter 3 PROJECT ANALYSIS

3.1 Idea generating

Each and every project maintain a pipeline, successful to execute the project and to run the project, generate an idea. In our society there are lot of artist can create different object model which is badly beautiful though it missing some spots to look naturally realistic and thus the model could not present beautifully as it is.

As I have interest on 3D sector, I've learned the modeling and animation technique over 4 years, but where comes to final output then observe the fact is during details modeling it takes a high configure PC hardware to render the animation file. Sometimes it hanged and interrupt a lot. But if done it within texture then it takes less time and render the details easily which can save a texture artist life.

3.2 Pipeline of Texture Process

Texturing is a broad process. Without texturing no objects express the environment of the story belongs. I have studied about different type of texturing phases and showing the pipeline which maintain to complete the project. Pipeline has divided into UV mapping, Shaders, Texturing, Materials;

- UV Mapping is the method of taking the surface of a 3D model and flattening it into a 2D representation in order to apply texturing. The problematic Phases is unwrapping 2D image



around 3D object. UVs directly related to vertices on Polygon or NURBS but the UV can't apply on 3D Space. They tied up to a 2D coordinate. UV's referred the surface of 3D model and fix it on the 2d flatten plane. These function unwrap the model and set the UV on 2D plane. The projection mapping helps to project the UV respectively to the model if the model similar to Planner, Cylindrical, Spherical, Box, Face etc. Automatic mapping, Find the best placement of UV simultaneously projecting from multiple planes.

- Shaders can refer as material. It describes the features of a vertex or pixel. It show the amount of light, darkness and color contain in image. There are some basic shaders, Like Color, Ambience, Transparency, Reflectivity, Refraction, Translucency etc

- Texturing defines- A picture or thing in a frame that gives an impression of being physically present with an assigned structure. Basically, it permits things that seemed level to the human eye to be show in a shape that takes into consideration different measurements. These measurements incorporate width, profundity, and stature.

Texturing is the procedure of making a reasonable 3D display, the way toward making and applying surfaces to a three-dimensional model. It gives the high detail into the surface. Texture is a variety of shading. Texture come in various configurations; this can be RGB surface, Greyscale surface, surface with alpha channel, monochrome surface and numerous others. Height map, bump map, normal map, displacement map, reflection map, specular map, occlusion map is the map where details assigned individually to makes 3D.

- Materials defined how surface should be rendered with the information of tilling, Texture, Color tints and more. Material show features of which shade is using on the model.

3.3 Modeling

3D modeling is a technique where a object or model or character create by computer generated software. Modeler manipulate points to create mesh. By collection of vertices object made. 3D

Modeling is a three-dimension images which is virtually set up on 2D surface. It consists of vertices, edges and polygons. There are three ways of model create: Polygonal modeling, curve modeling, Digital Sculpting etc.

- Polygonal modeling--Points in 3D Space, called vertices which are connected by edge to form polygon mesh.
- Curve modeling— Surfaces are defined by curves which can control.
- Digital sculpting—where model create by sculpt from clay and give the shape easier than using others tools.

I like the process of polygonal modeling, I used Autodesk max and Autodesk maya for creating the base shape of character by keeping the references of Front and side view image.



Figure 3.1: Warrior modeling

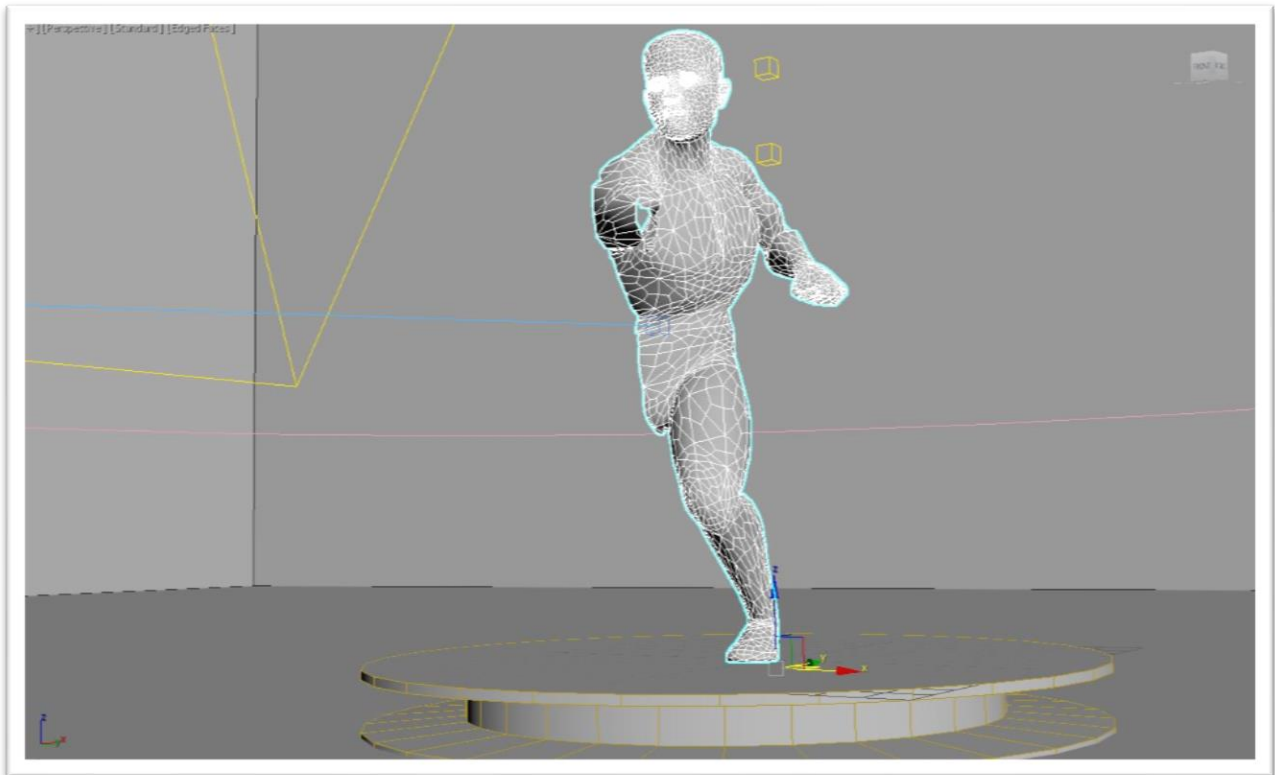


Figure 3.2: Warrior model wireframe mode

3.5 Clean topology

While making a character it's better to keep the topology at quad for deform better. It is very important to keep your topology clean and available for easy and predictable subdividing. Clean topology-based model can use further uses. Where odd triangle and nGon won't subdivided smoothly.

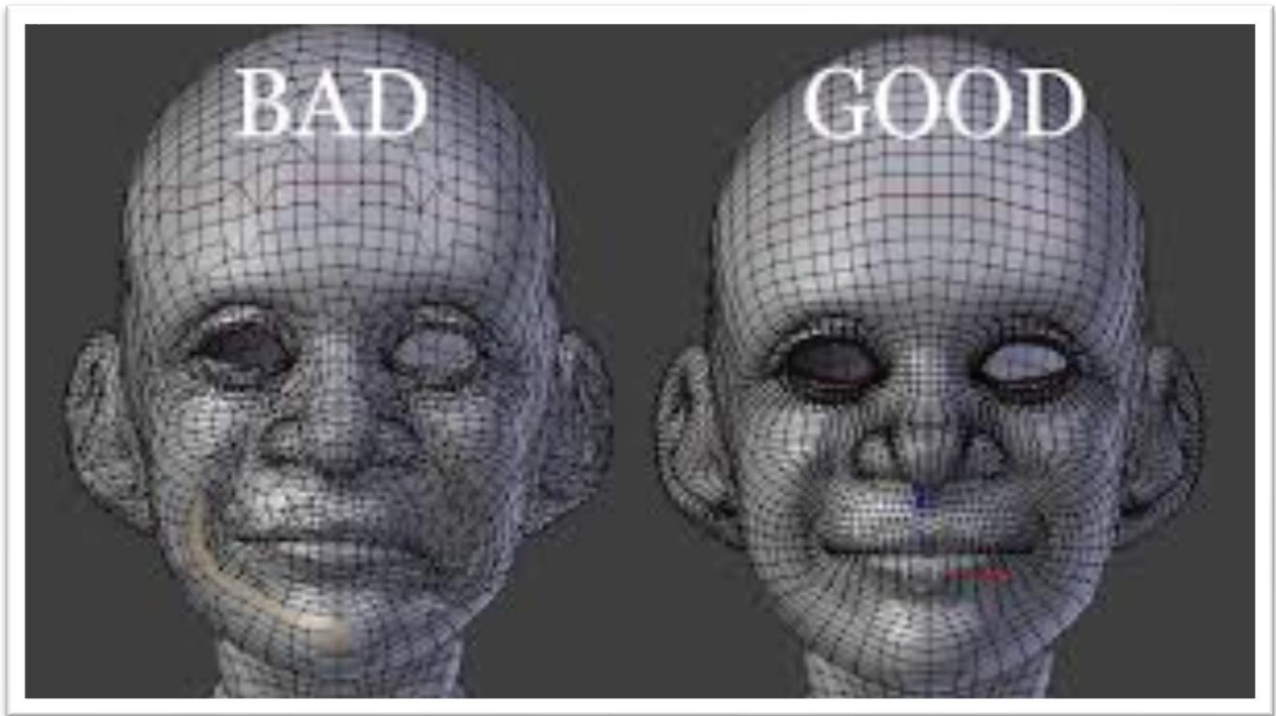


Figure 3.3 Bad vs good topology

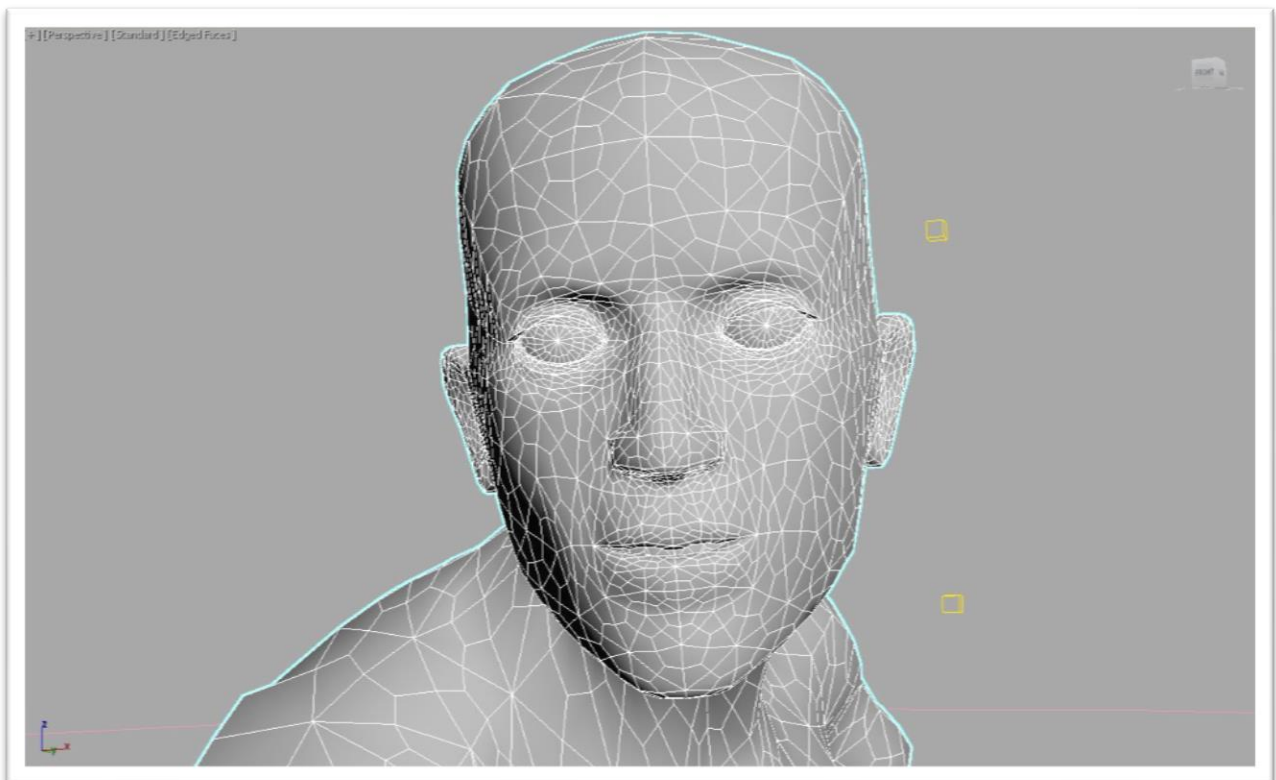


Figure 3.4 Warrior Clean based topology.

3.4 Polygon Count

Polygon based modeling shows how much polygon used to finish the character. For show the detailing in render if we use to create modeling tiny details then the file will higher for load and polygon will increase. But if use the procedure of texturing then the benefit is polygon will less, File will easy to load and quality will high as rendering as the well 3D texturing image.



Figure 3.5 Warrior polygon amount.

3.6 Unwrapping map

After completing and clean topology select the modifier of unwrapping UVW and open UV editor then flatten the image according to need. As I have use Autodesk Max for unwrapping so it is the primary phases. To complete the model easier way for unwrapping is apply the projection mapping as Planner, Cylindrical, Cubic, Spherical map which depends on the shape. Have to be careful on seam placement.

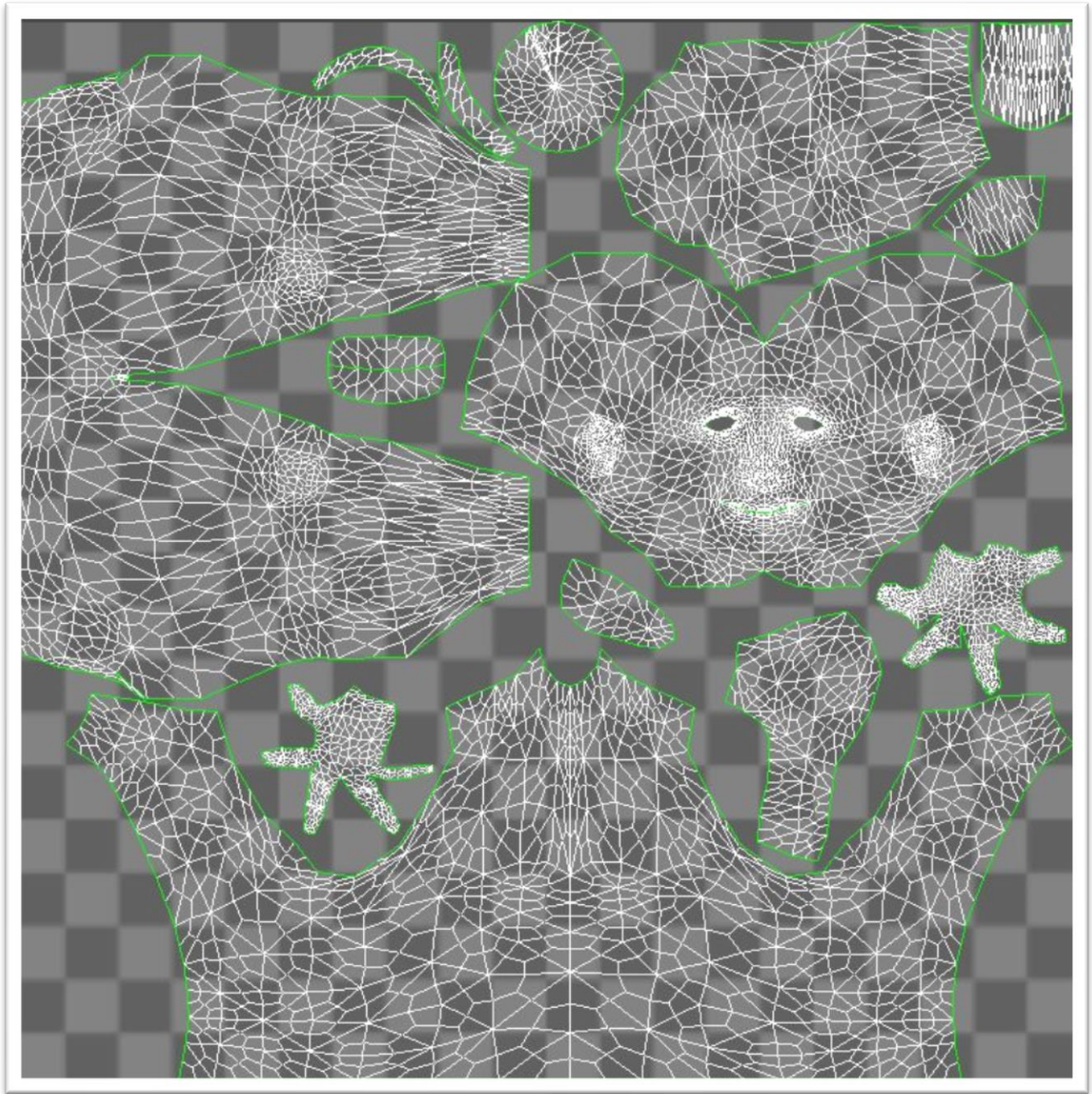


Figure 3.6 Warrior unwrapping.

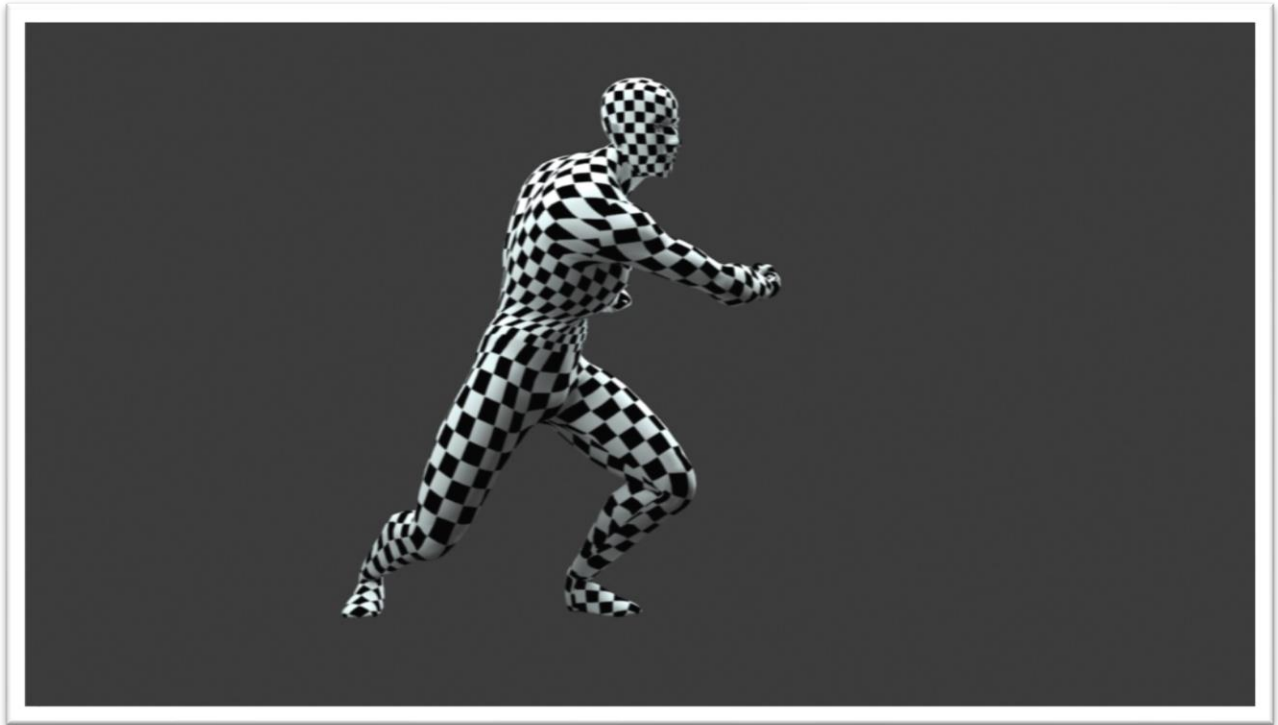


Figure 3.7 Warrior checker Mood.

3.7 Texturing

After complete the step of unwrapping, then apply different shaders on different props. Because, it will help us for selecting the geometry. In character there are lots of individual models. So here apply various shaders, as we know, Shaders can refer as material. It describes the features of a vertex or pixel. It show the amount of light, darkness and color contain in image. There are some basic shaders, Like Color, Ambience, Transparency, Reflectivity, Refraction, Translucency etc. Like the slop is the sign of reflectivity etc.



Figure 3.8 Warrior Texturing.

3.8 UV Mapping

UV Mapping is the method of taking the surface of a 3D model and flattening it into a 2D representation in order to apply texturing. The problematic Phases is unwrapping 2D image around 3D object. UVs directly related to vertices on Polygon or NURBS but the UV can't apply on 3D Space. They tied up to a 2D coordinate. UV's referred the surface of 3D model and fix it on the 2d flatten plane. These function unwrap the model and set the UV on 2D plane. The projection mapping helps to project the UV respectively to the model if the model similar to Planner, Cylindrical, Spherical, Box, Face etc. Automatic mapping, Find the best placement of UV simultaneously projecting from multiple planes.

3.8.1 Diffuse Map

Diffuse is a property of a shader. A shader is applied to the 3D geometry/object to give it a surface. Diffuse map is one kind of texture map including color and pattern of the object. It's like painting on the surface of 3D character model.



3.8.2 Normal map

An Normal Maps makes the deception of detail without depending on a high poly check. It is commonly used to fake high resolution details on low resolution model.

3.8.3 Bump Map

Bump map is the greyscale image that combine with adding shadow and highlights to the surface of the the 3D model. It refers the wrinkles and bump in image.

3.8.4 Specular map

Specularity, how a surface reflects light. It is fundamentally the surface's impression of the light source and makes a gleaming look.

3.8.5 Glossiness map/ Roughness maps

Roughness maps are all about how blurry the reflection will be. Roughness is the 'bumpiness' of the surface on a micro level. More roughness scatters the light and the reflection will be blurrier. “reddit.com”

3.8.6 Transparency Maps

A transparency map controls per-pixel transparency. The shader will control which channel store the transparency map in. Mainly Dirty glass or frosted glass based on transparency map.

3.9 Material Set by Different Map

A character, it's combined with many tiny details like Hand, Leg, Body, Cloth, different props etc. So every props won't the similar materials, that's why material will be different according to the real object. Texturing on 3ds Max, set the image on UV map which get from unwrapping the model. then the image assign on specific map for the particular result. like sword secularity will be high than any kind of clothes. Here I'm going to show the warrior's shoulder safeguard.

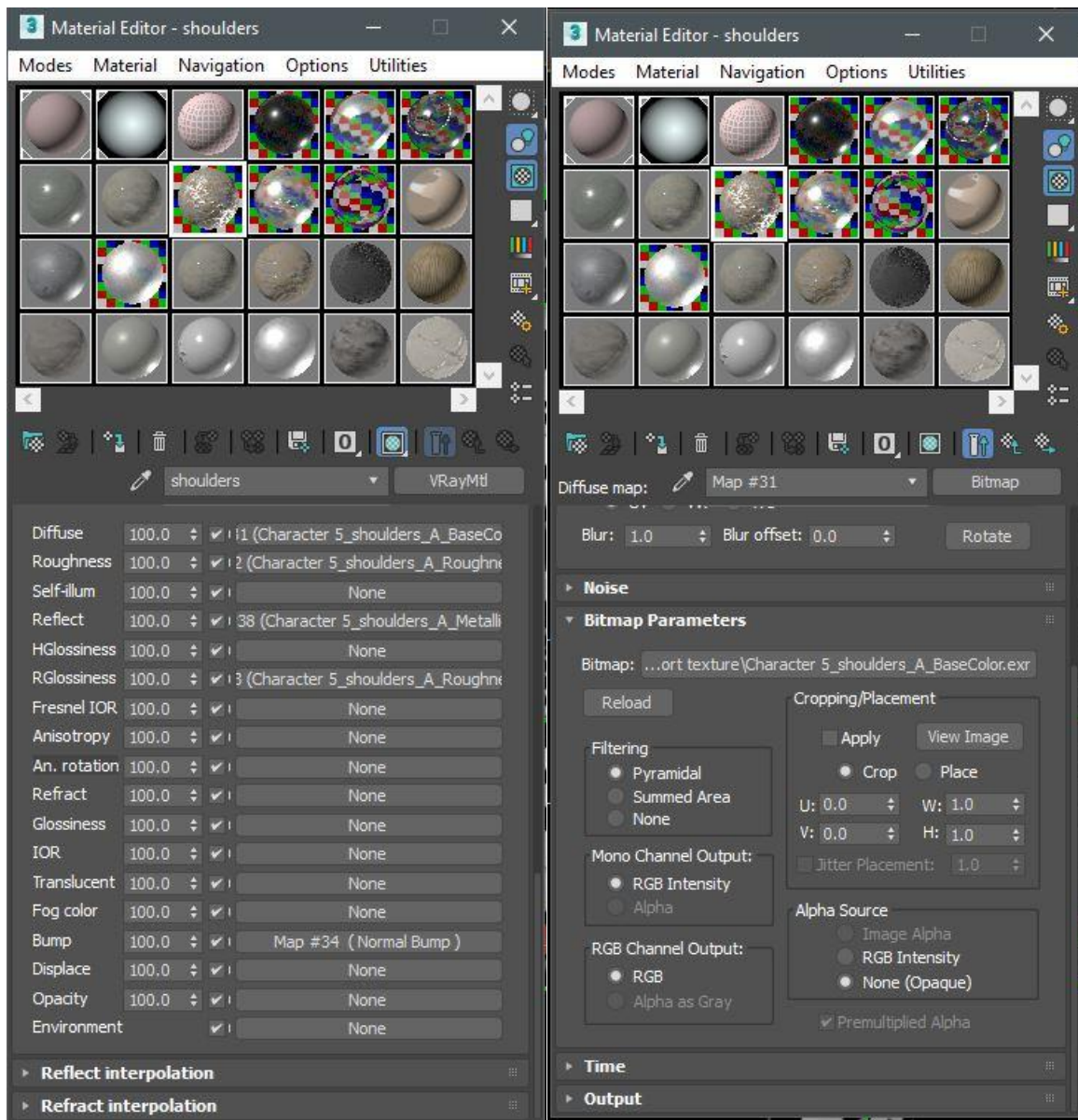


Figure 3.9 Material set in map (Left) and (Right) Diffuse map

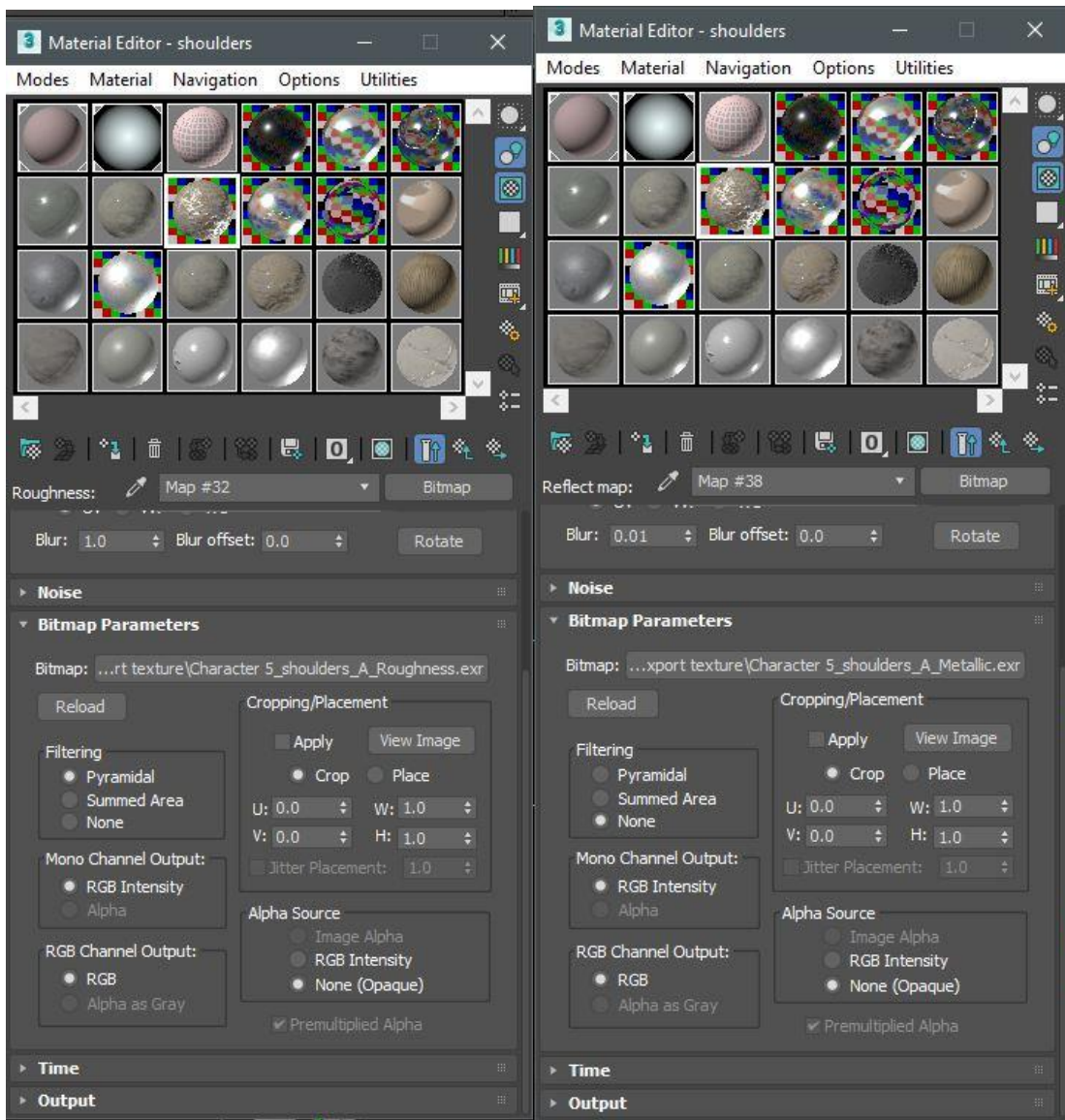


Figure 3.10 Roughness map (Left) and (Right) Reflect map.

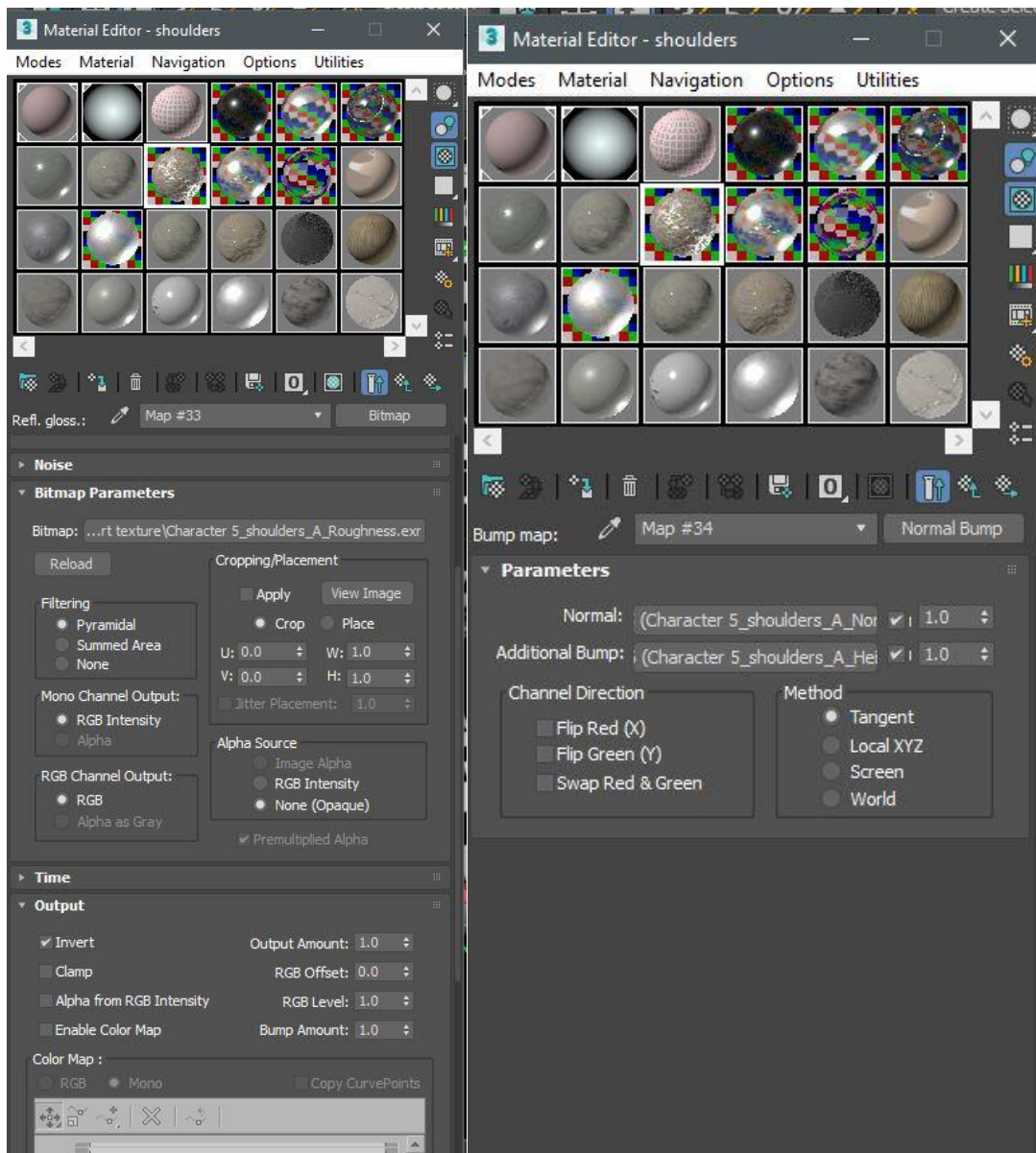


Figure 3.11 RGlossiness map (Left) and (Right) Bump map.

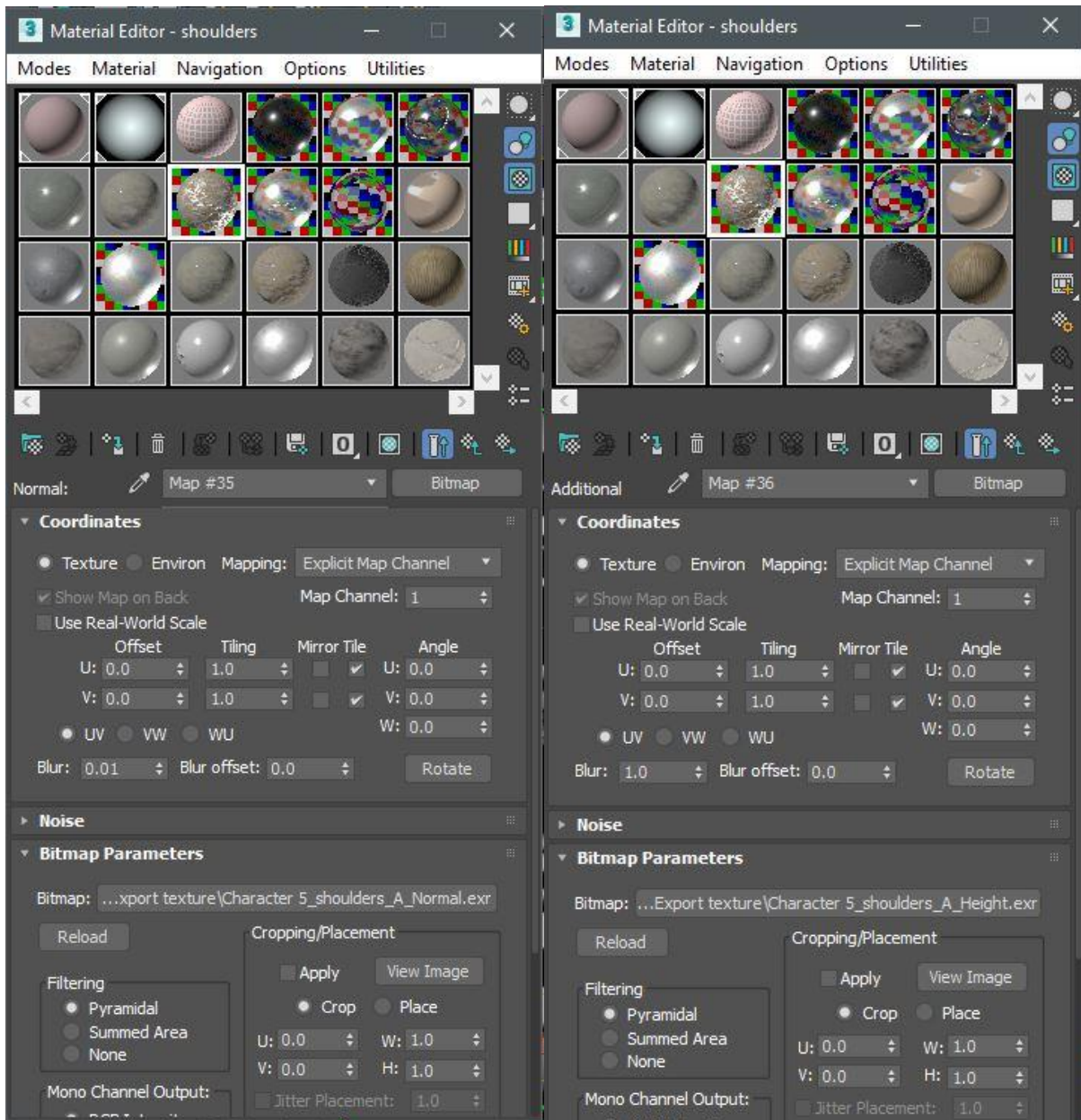


Figure 3.12 Normal map (Left) and (Right) Additional Bump map.

3.10 Baking

Baking is the process of transferring mesh-based information into textures. information read by shaders and substance filters to perform advanced effects. Most modern game engine and offline



renderer uses these baked textures. Baked textures are used in Substance Painter to add details and quickly texture an asset via advanced mask generators and filters. There are mandatory to be able to use Smart Materials. “support.allegorithmic.com”

3.10.1 ID

This baker allows you to create a normal map from a high definition mesh. “support.allegorithmic.com”

3.10.1 Curvature

The curvature baker allows you to extract and store concave and convex information related to your mesh.

- The black values represent the concave areas
- The white values represent the convex areas
- The gray values represent neutral/flat areas. “support.allegorithmic.com”

3.10.2 Normal

This baker allows you to extract a world space normal map from the model. If a normal has been baked, it will be used in addition to the low-poly mesh to compute the world space normal. “support.allegorithmic.com”

3.10.3 Ambient Occlusion map

This baker uses the high definition meshes to compute the occlusion to produce accurate results and store them into a texture that match your low-poly mesh. “support.allegorithmic.com”

3.10.4 Thickness

The thickness baker is very similar to the ambient occlusion baker, but it casts the rays in the opposite direction of the surface normal.

- The black values represent the thin parts of the model.
- The white values represent the thick parts of the model. “support.allegorithmic.com”

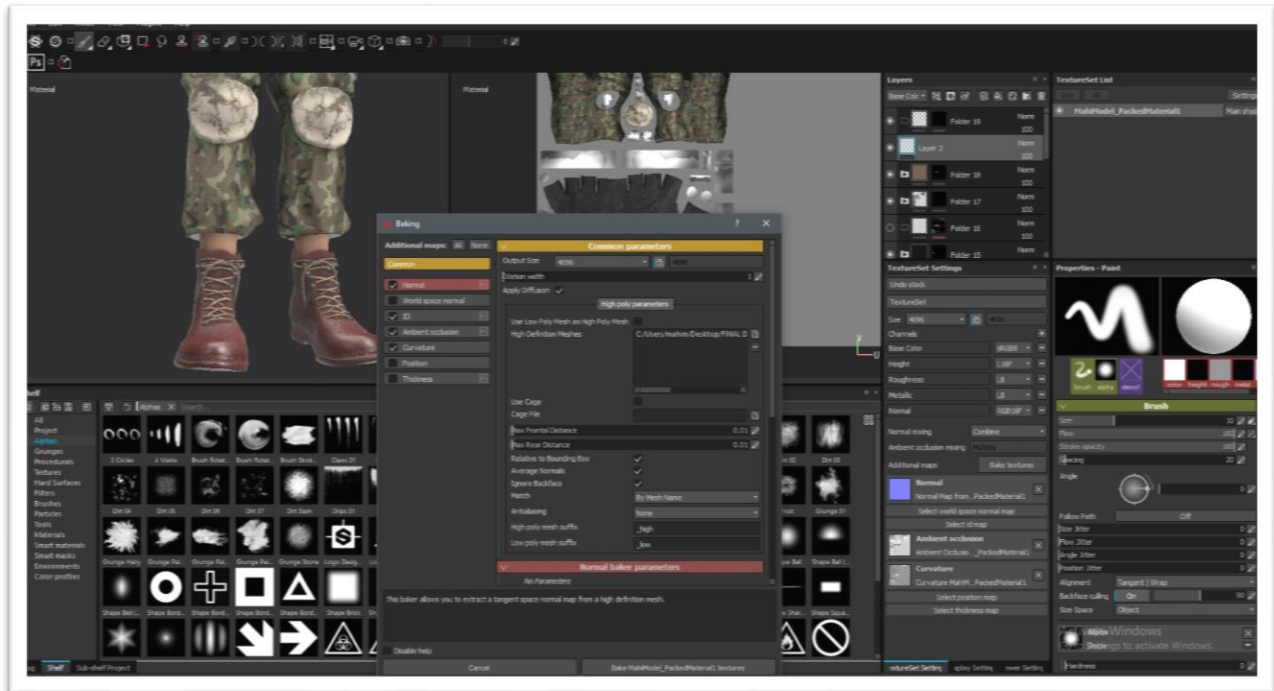


Figure 3.13 Army model Baking process.

Army model bake into Three categories, Normal, Ambient occlusion, Curvature, I didn't use ID map. because we know that, for ID map we have to give different shaders into the model different objects. So that after import in substance painter, we can control the specific objects easily. But here the problem is file will trouble to control and file size will high. For ID map we have to copy the main character. one named as “target model (Main mesh)” and another name is “source model (ID mesh)”. In ID map the model will get a color material. And then bake texture with hide the ID model.

After import the model into Substance painter as *fbx, firstly bake the texture into Normal, Ambient occlusion, Curvature. It will generate easily with the help of software. Then the advanced texturing part starting with the help of substance painter interface tools.

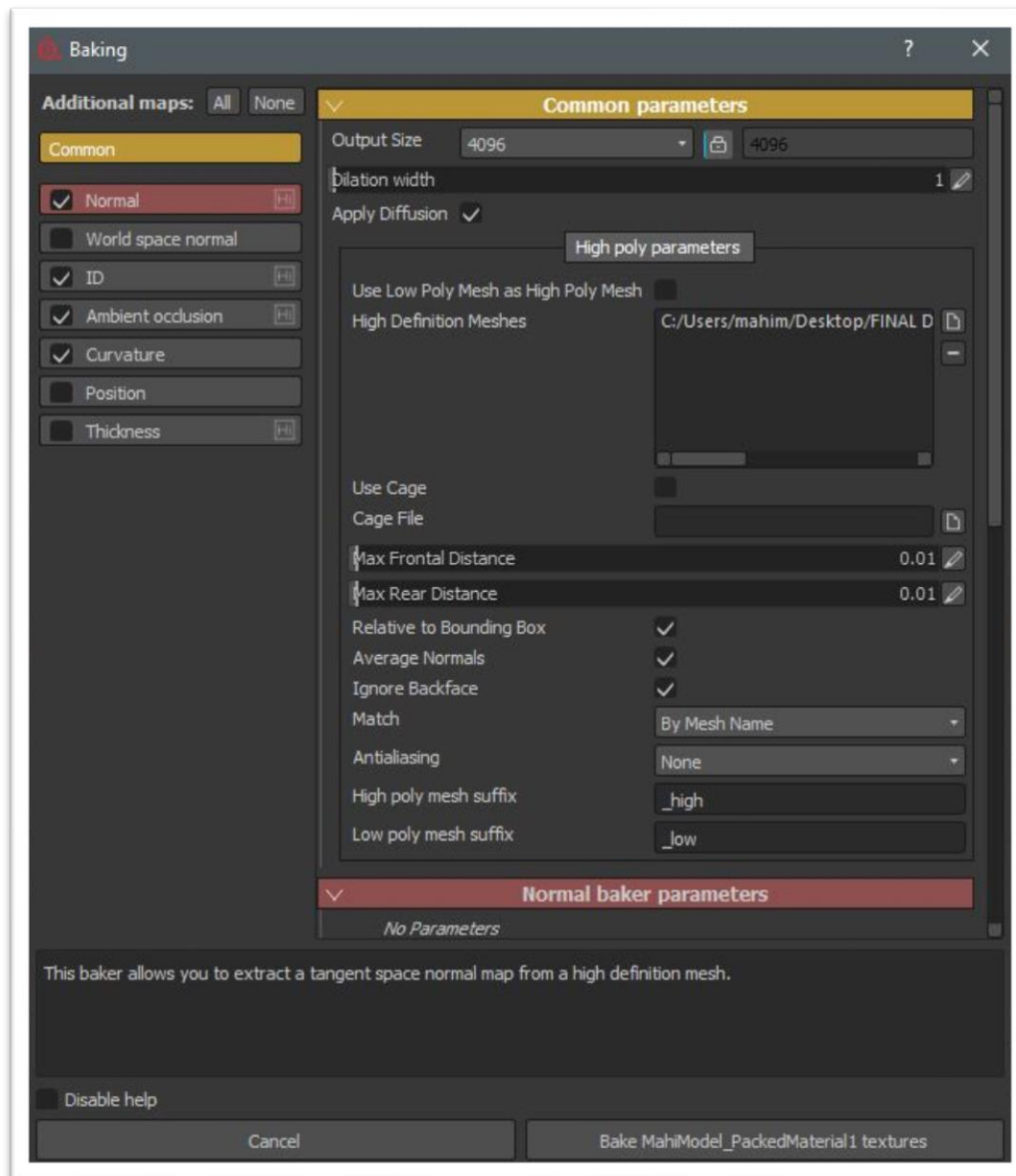


Figure 3.14 Baking process.

3.11 Lighting

Lighting is important parts of 3D final projecting. Lighting where the real magic happens. The main purpose to use light is naturalistic the scene where object present and illuminate them

properly. Where the excellent model, well placed texture, clever rigging, good animation, and realistic lighting make the project impressive. There are three types of lighting,

- 1 Point Lighting—Here use 1 light to illuminate the scene where no appreciable fill light is present.
- 2 Point Lighting—Use 2 Light Source present in the scene.
- 3 Point Lighting—Here 3 Light source uses , one is key light,another fill light and lastly back or rim light.

In this project I have used two types of lighting technique one is three-point light and another is HDRI lighting technique, Where the HDRI Lighting gives overall light to illuminate the darkness from the object. And three-point light gives more dramatic and attractive feeling. Basically, In Autodesk 3ds Max, arrange the platform with three-point light. and In Substance painter, Arrange with HDRI panorama resolution.



Figure 3.15: HDRI light for Warrior Character in substance Painter.



Figure 3.16 HDRI light for Army Character in substance Painter.

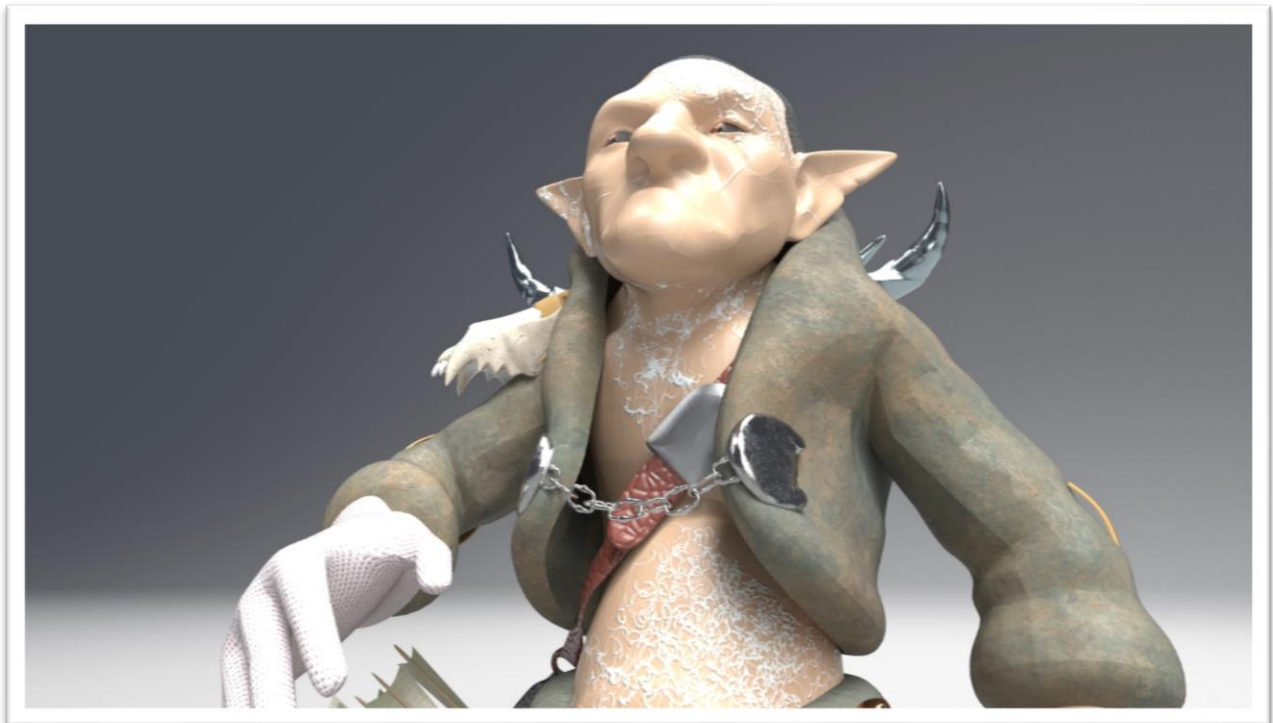


Figure 3.17 HDRI light for goblin Character in substance Painter.



Figure 3.18 Three point light for Warrior character in 3ds Max.



Figure 3.19 Three point light for Army character 3ds Max.



Figure 3.20 Three point light for Goblin character 3ds Max.

3.12 Rendering Engine

As we know there are various types of rendering engine. Every engine has a significant features compare to other render engine output. Arnold, Vray, Corona, Iray, Indigo, Mental ray, Maxwell, Keyshot etc. Scanline, Raytracing, Global Illumination etc are some of Render engine. In here vray, Iray,Scanline used as render engine. All are advanced rendering engine.For example;

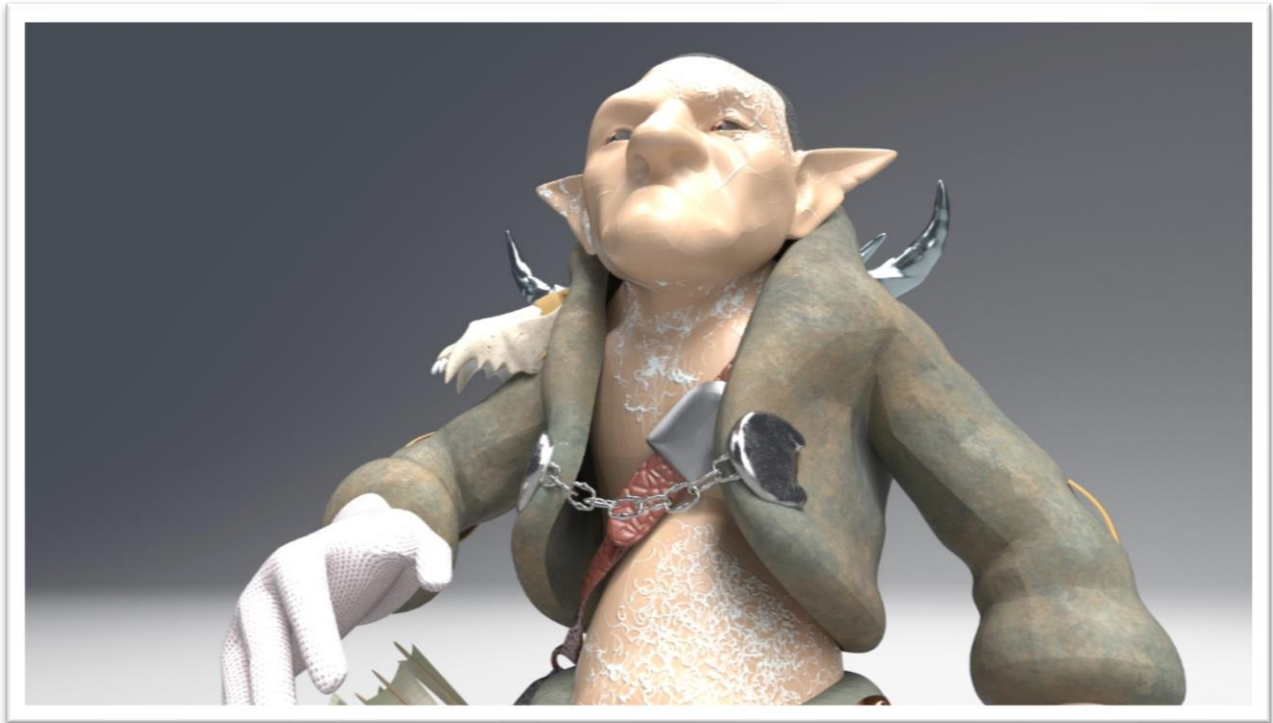


Figure 3.21 Iray Goblin rendering in Substance Painter



Figure 3.22 Vray Goblin rendering in 3DS Max.



Figure 3.23 Vray Army rendering in 3DS Max.



Figure 3.24 Iray Army rendering in Substance painter.



Figure 3.25 Vray Warrior rendering in Substance painter.



Figure 3.26 Iray Warrior rendering in 3DS Max.

3.13 Maps

Here lots of maps use for individual Character. Following mention some maps;

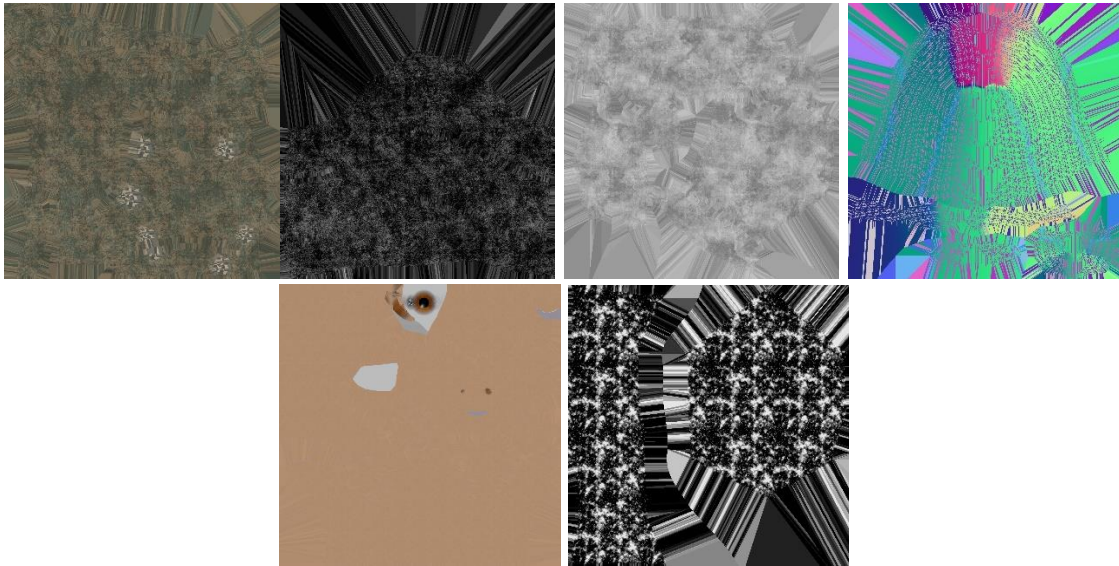


Figure 3.27 Some of warrior materials (Left) Diffuse map of upper leg safeguard. Specular Map, Gloves Roughness map, Hair Normal map, Body Diffuse map, Knee Specular map etc.

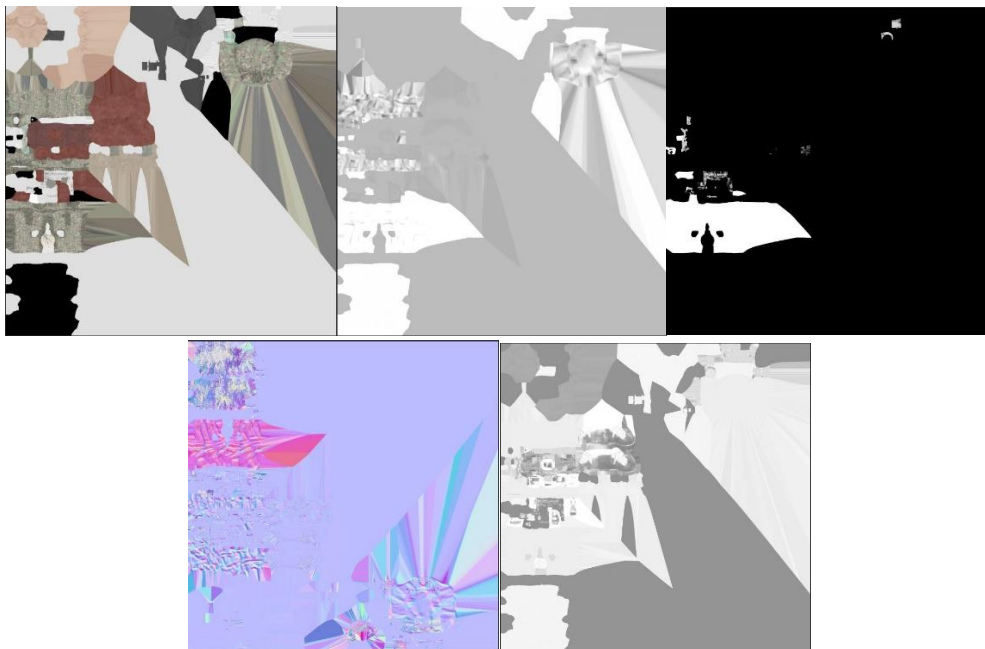


Figure 3.28 (Left) Army Diffuse map, Specular map, Height map, Normal map and Roughness map from Substance Painter.

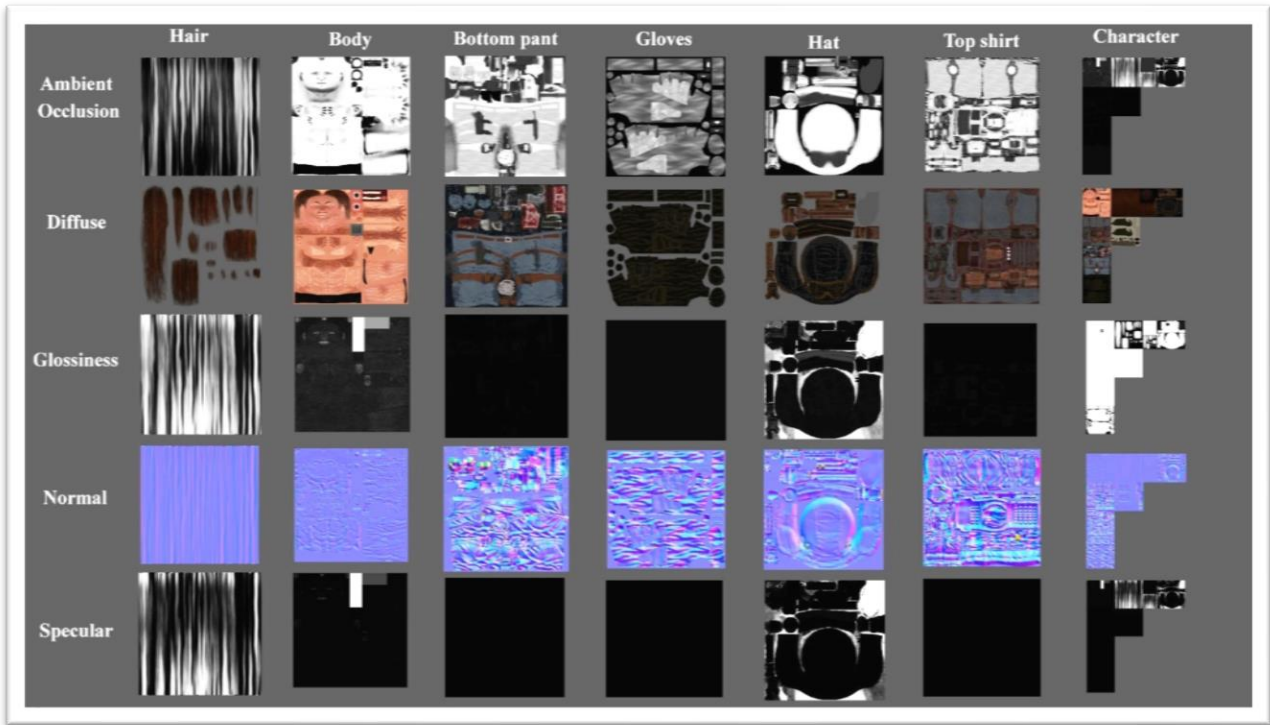


Figure 3.29 Army UV maps from 3DS Max.

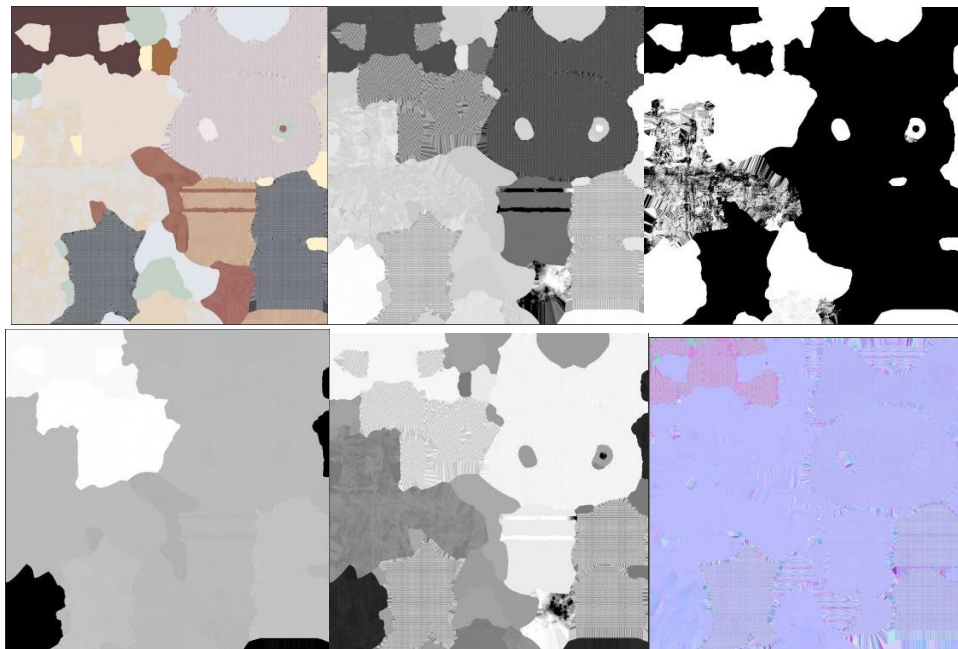


Figure 3.30 (Left) Goblin Diffuse map, Glossiness map, Specular map, Bump map, Roughness map, and Normal map from Substance Painter.

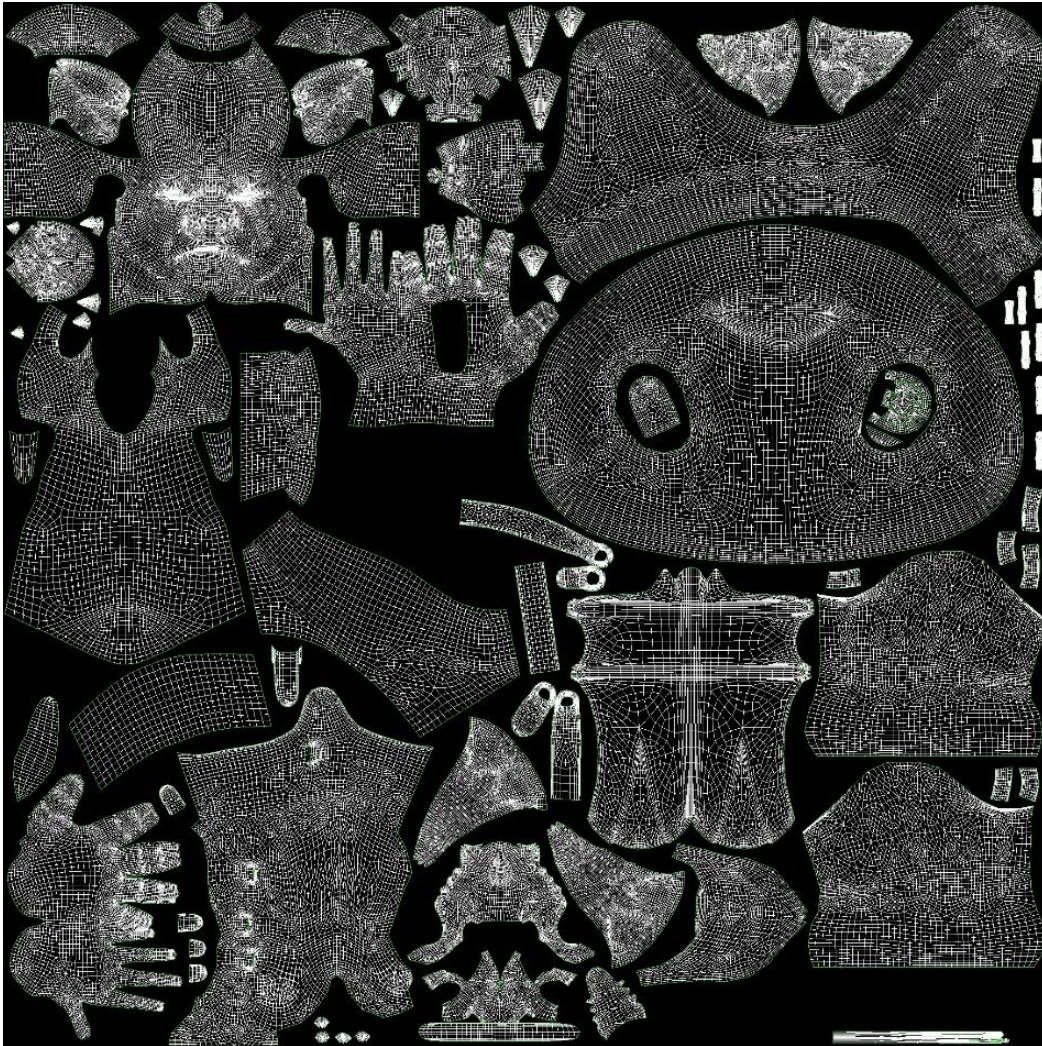


Figure 3.31 Goblin UV Map export from 3DS Max.



4. 3D CHARACTER CREATION STEP BY STEP

Chapter 4 DESIGN AND TEXTURING

4.1 Synopsis

This section will demonstrate the procedure of 3D character creation well ordered. The initial segment demonstrates to draw the character's 3D show sheet and gives tips for keeping every one of the perspectives predictable along with details texture. The last parts will center around various parts of making and setting up the 3D character demonstrate for use in computer games or films. The character included for instance won't be utilized in an amusement yet will be made so that it could be utilized in a diversion. The character will have all bits of Clothes demonstrated independently so they can be prepared and un-prepared as essential. Covering bits of dress will have a few polygons expelled to make the model lighter. In the event that it can't be seen, it won't be rendered. The point is to have the character's body comprise of around 5,000 polygons while wearing any mix of dress while the character's head ought to have around 1,000 polygons. Along these lines the entire character model ought to have around 6,000 polygons.

4.2 Warrior Character Model

Warrior character create based on lots of reference. This character combined with Chest vest, Body safeguard, Pendent, Helmet, Sword, Shield, Slope, Gloves, Boots, knee safeguard, Shoulder safeguard, Hair, Beard, The body structure create on 3DS Max then unwrapping at middle according to proper use. Give different Shaders to the individual parts so that the individual object mesh can select. After unwrapping save the different UV Map. Texture image set on Adobe Photoshop. render the Desire pass from render setup. Like Normal, Bump, Specular, Glossiness, Roughness etc. Now select the Vray material also select the specific geometry. Assign the maps into the particular parameter. Set 3 point light and render the scene from 3DS Max. (Output 1). Export as obj format and import in substance painter the mesh as obj. then bake the texture into ID, Normal, Curvature, Ambient Occlusion. Finally then texturing start with substance painter. Set HDRI Light and render image from Substance painter. (Output 2)

4.2.1 Hair Formation in 3ds Max

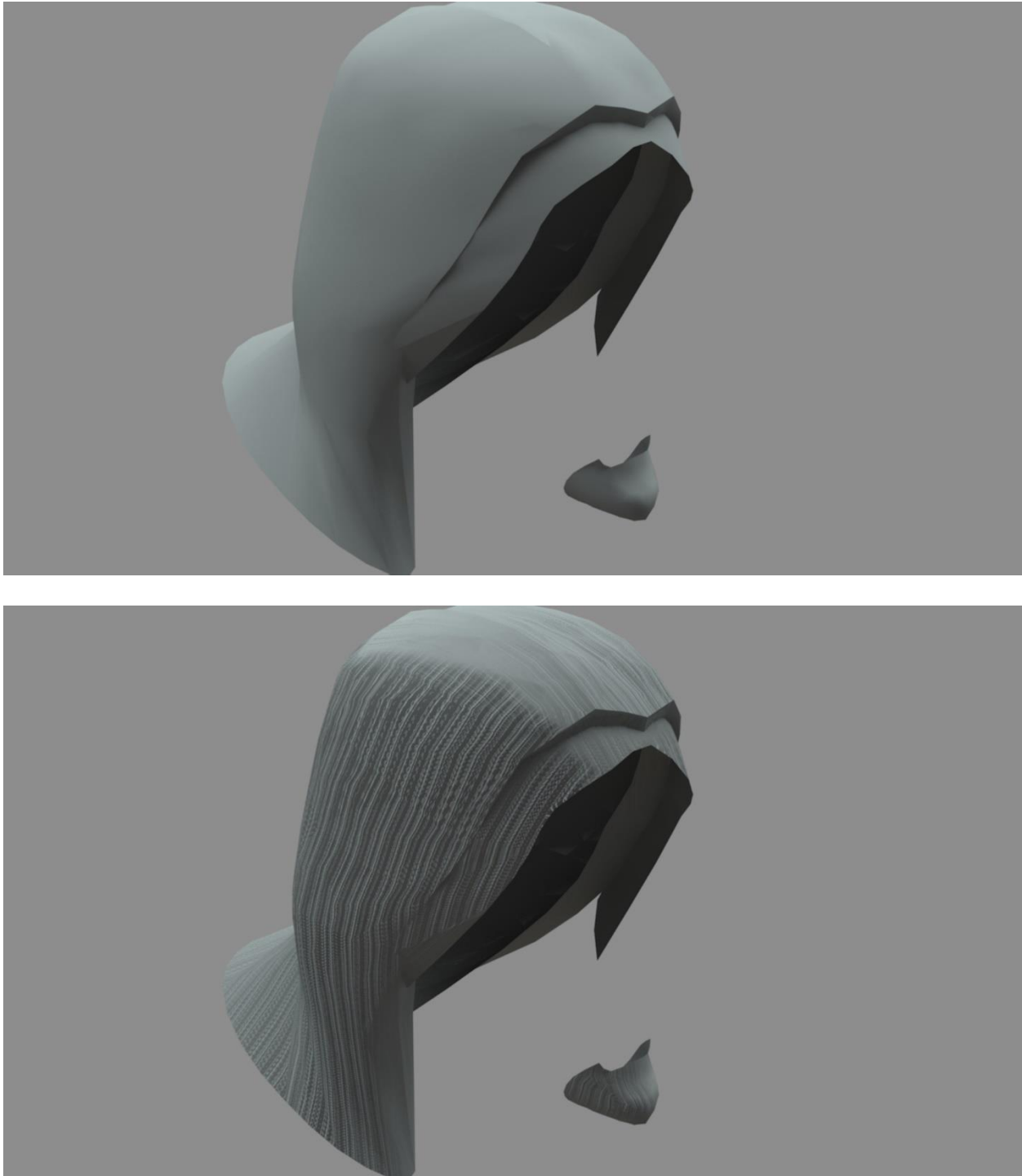


Figure 4.1 Hair formation in 3DS Max

4.2.2 Hair Formation in Substance Painter



Figure 4.2 Hair formation in Substance Painter

4.2.3 Body Formation in 3ds Max

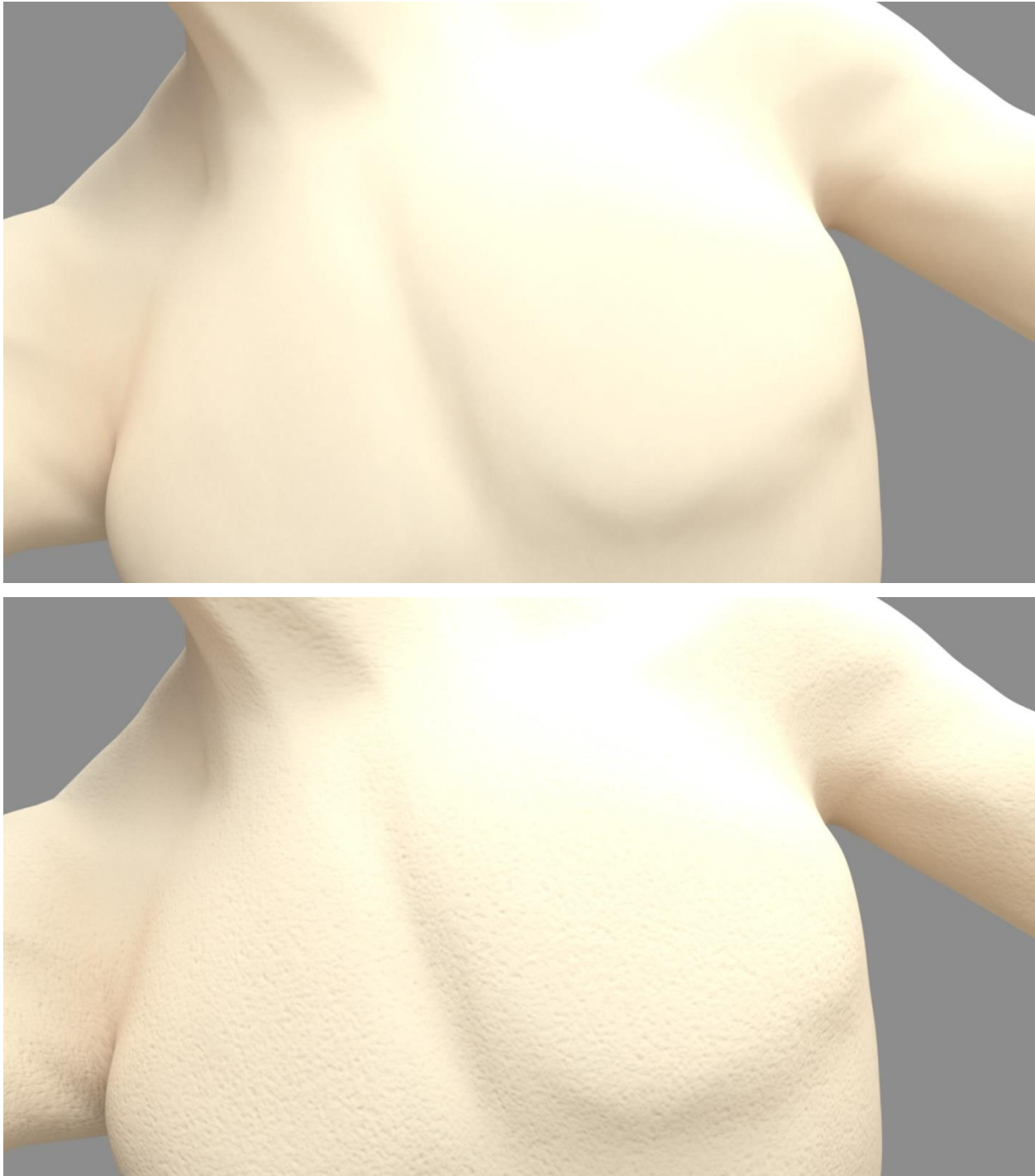


Figure 4.3 Body formation in 3DS Max

4.2.4 Body Formation in Substance Painter

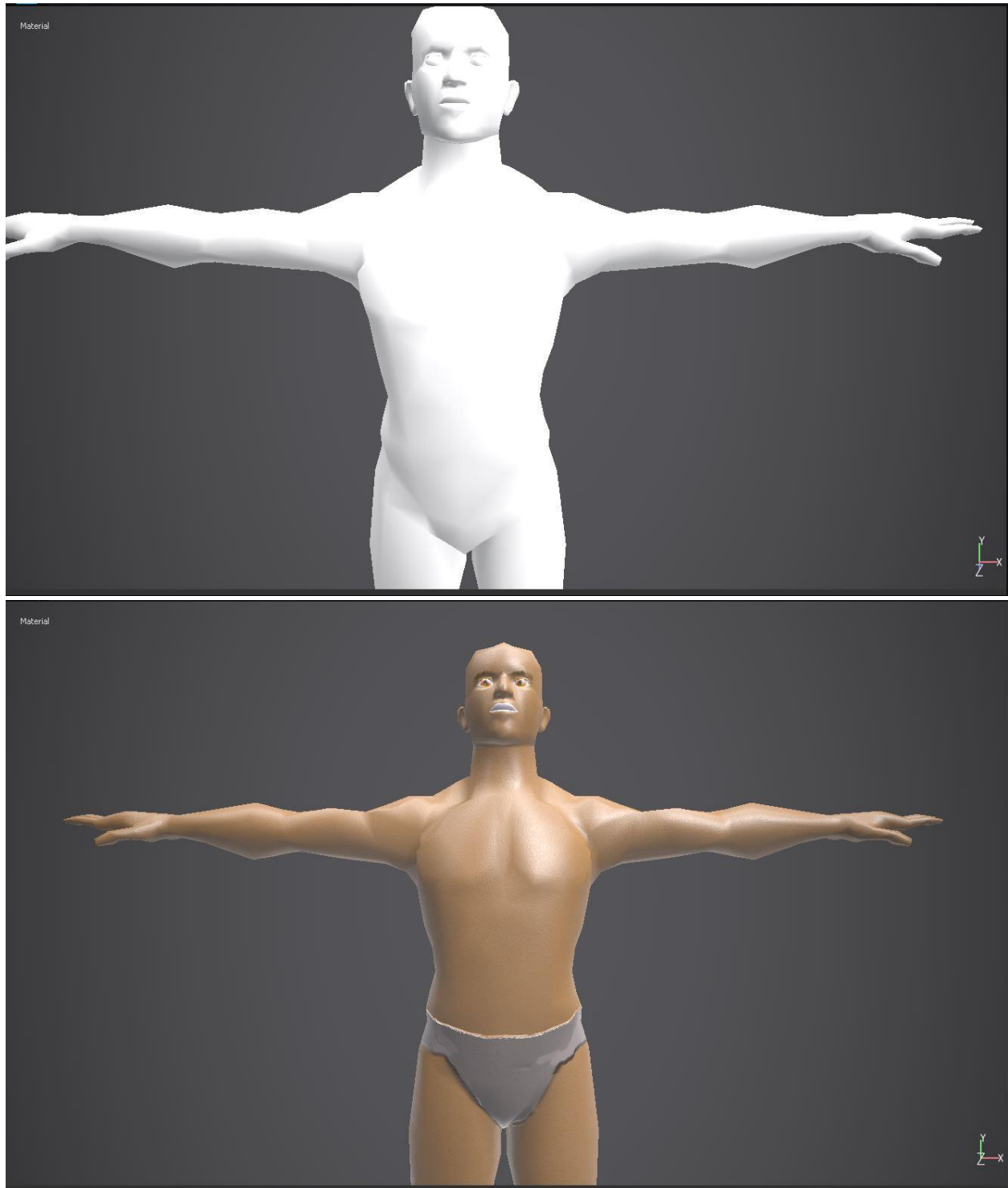


Figure 4.4 Body formation in Substance Painter

4.2.5 Cloth Formation in 3ds Max

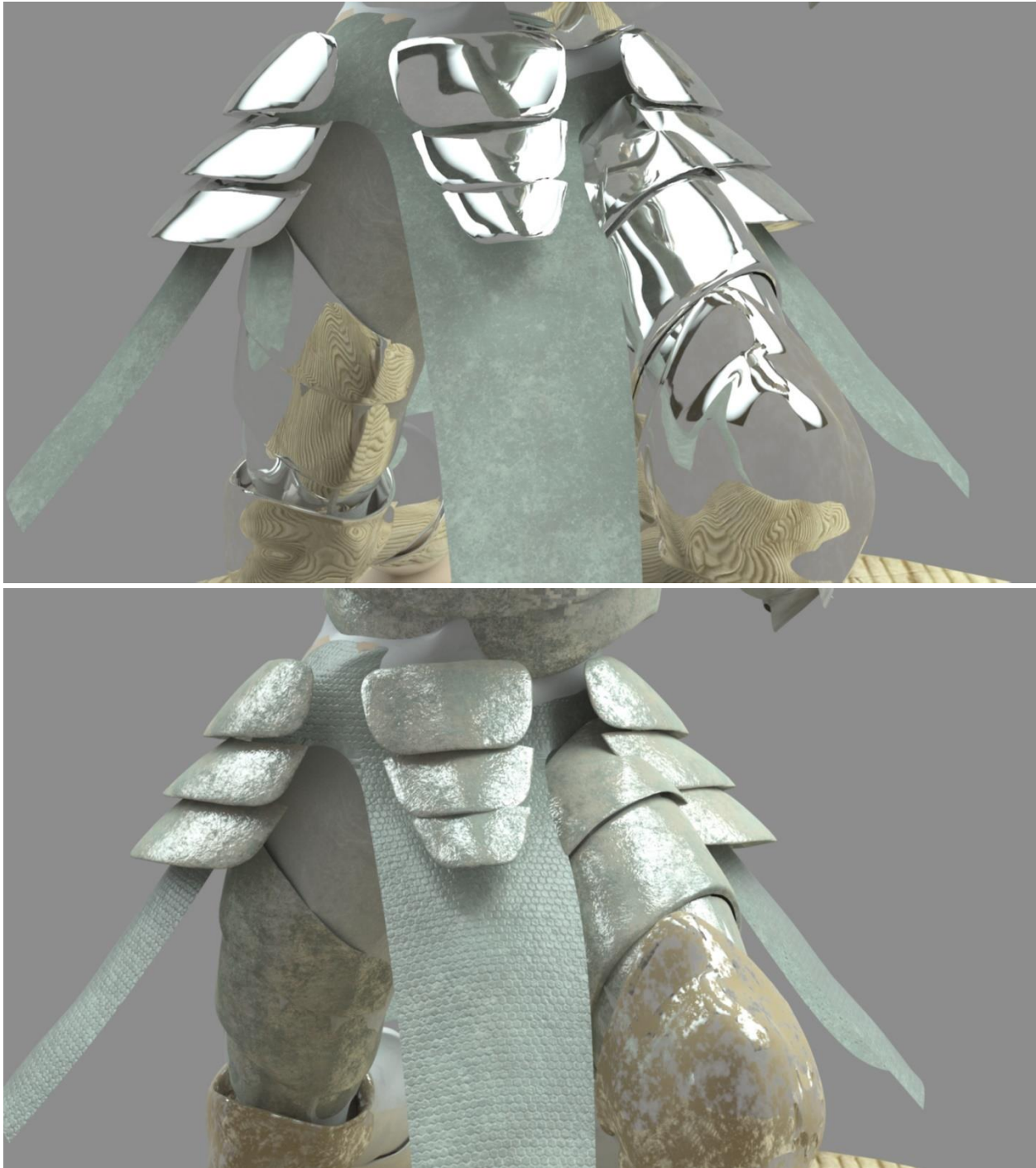


Figure 4.5 Cloth formation in 3DS Max

4.2.6 Cloth Formation in Substance Painter

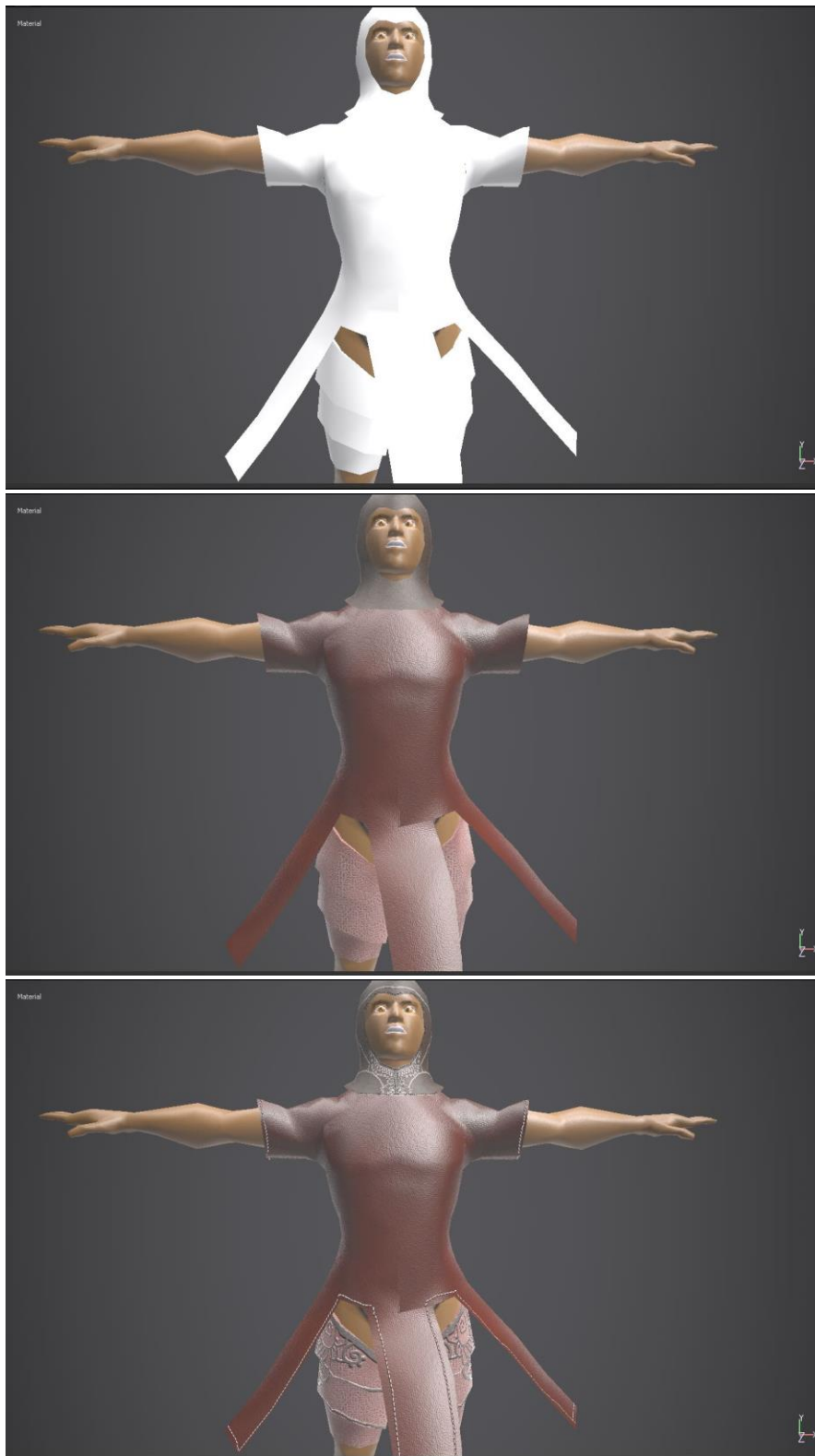


Figure 4.6 Cloth formation in Substance Painter

4.2.7 Face Formation in 3ds Max



Figure 4.7 Face formation in 3DS Max

4.2.8 Face Formation in Substance Painter

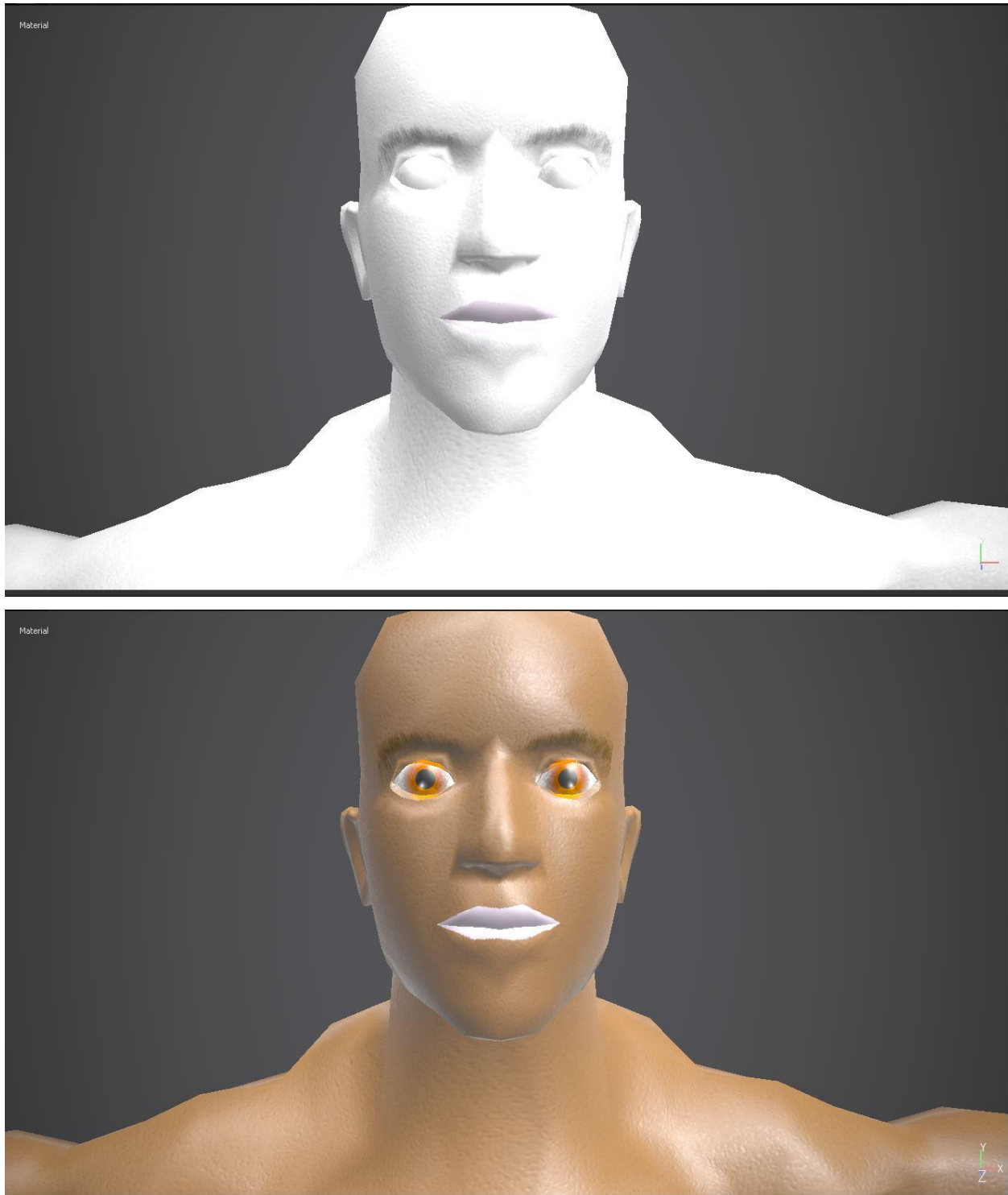


Figure 4.8 Face formation in Substance Painter

4.3 Goblin Character Model

Goblin character taken from external source “*mixamo*”. This character combined with Horn, Tops, Bag, Mask, Trousers, Shoe, Arrow, Water bag. The body structure unwrapping at middle according to proper use. Give different Shaders to the individual parts so that the individual object mesh can select. After unwrapping save the different UV Map. Texture image set on Adobe Photoshop. Render the Desire pass from render setup. Like Normal, Bump, Specular, Glossiness, Roughness etc. Now select the Vray material also select the specific geometry. Assign the maps into the particular parameter. Set 3 point light and render the scene from 3DS Max. (Output 1). Export as obj format and import in substance painter the mesh as obj. then bake the texture into ID, Normal, Curvature, Ambient Occlusion. Finally then texturing start with substance painter. Set HDRI Light and render image from Substance painter. (Output 2)

4.3.1 Hair Formation in 3ds Max



Figure 4.9 Hair formation in 3DS Max

4.3.2 Hair Formation in Substance Painter

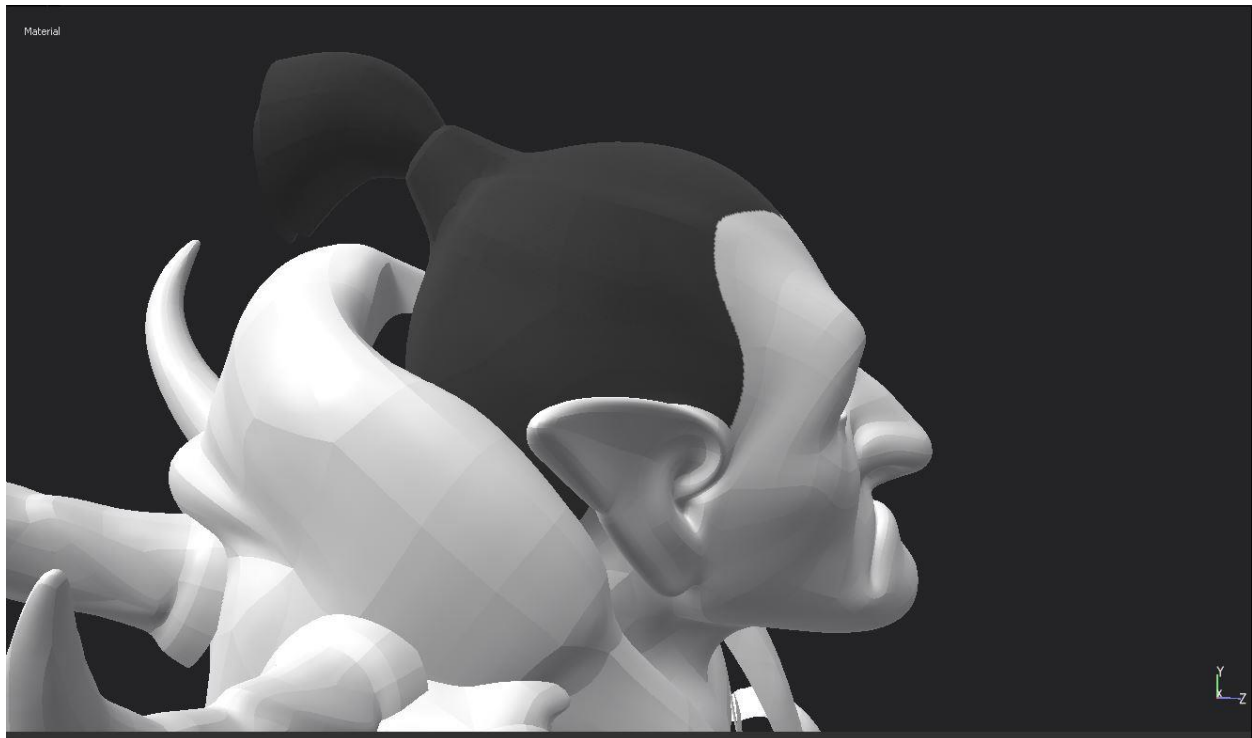


Figure 4.10 Hair formation in Substance Painter

4.3.3 Body Formation in Substance Painter



Figure 4.11 Body formation in Substance Painter

4.3.4 Body Formation in 3ds Max

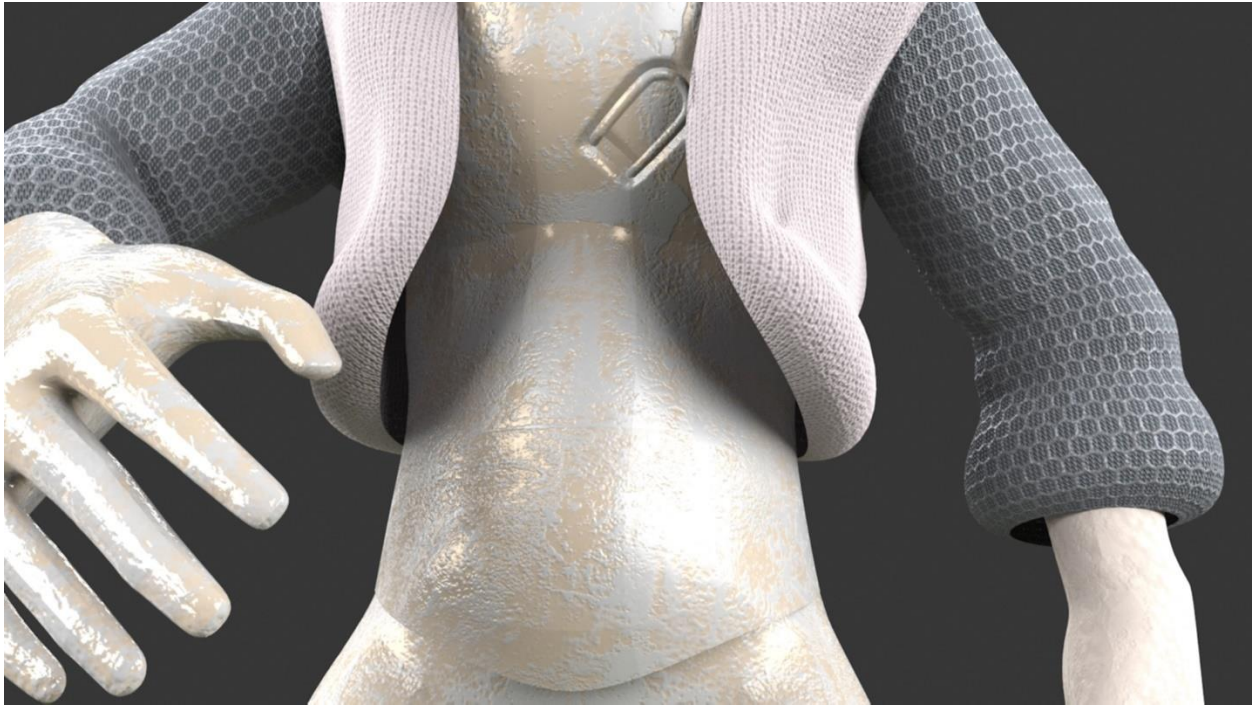


Figure 4.12 Face formation in 3DS Max

4.3.5 Cloth Formation in 3ds Max



Figure 4.12 Cloth Formation in 3DS MAX

4.3.6 Cloth Formation in Substance Painter



Figure 4.13 Cloth formation in Substance Painter

4.3.7 Face Formation in 3ds Max



Figure 4.14 Face formation in 3DS Max

4.3.8 Face Formation in Substance Painter





Figure 4.15 Face formation in Substance Painter

4.4 Army Character Model

Army character create based on lots of reference. This character combined with Chest vest, Knife, Pistol, Helmet, Gloves, Boots, knee safeguard, Hair, Beard, The body structure create on 3DS Max then unwrapping at middle according to proper use. Give different Shaders to the individual parts so that the individual object mesh can select. After unwrapping save the different UV Map. Texture image set on Adobe Photoshop. render the Desire pass from render setup. Like Normal, Bump, Specular, Glossiness, Roughness etc. Now select the Vray material also select the specific geometry. Assign the maps into the particular parameter. Set 3 point light and render the scene from 3DS Max. (Output 1).

Export as obj format and import in substance painter the mesh as obj. then bake the texture into ID, Normal, Curvature, Ambient Occlusion. Finally then texturing start with substance painter. Set HDRI Light and render image from Substance painter. (Output 2)

4.4.1 Cloth Formation in 3ds Max



Figure 4.16 Cloth formation in 3DS Max.

4.4.2 Cloth Formation in Substance Painter



Figure 4.17 Cloth formation in Substance Painter

4.4.3 Hair Formation in 3ds Max



Figure 4.18 Hair formation in 3DS Max.

4.4.4 Hair Formation in Substance Painter



Figure 4.19 Hair formation in Substance Painter

4.4.5 Body Formation in 3ds Max



Figure 4.20 Body formation in 3DS Max.

4.4.6 Body Formation in Substance Painter



Figure 4.21 Body formation in Substance Painter

4.5 Rigging

For final output T-pose is not suitable posture. For that have to rigged the model to give it desire gesture. As we know that, Rigging is bone setup on Character body. Autodesk Maya has a feature named “quick rig setup” from rigging options. it’s easy to assign into the model within short time.



Figure 4.22 Army Character Rigging

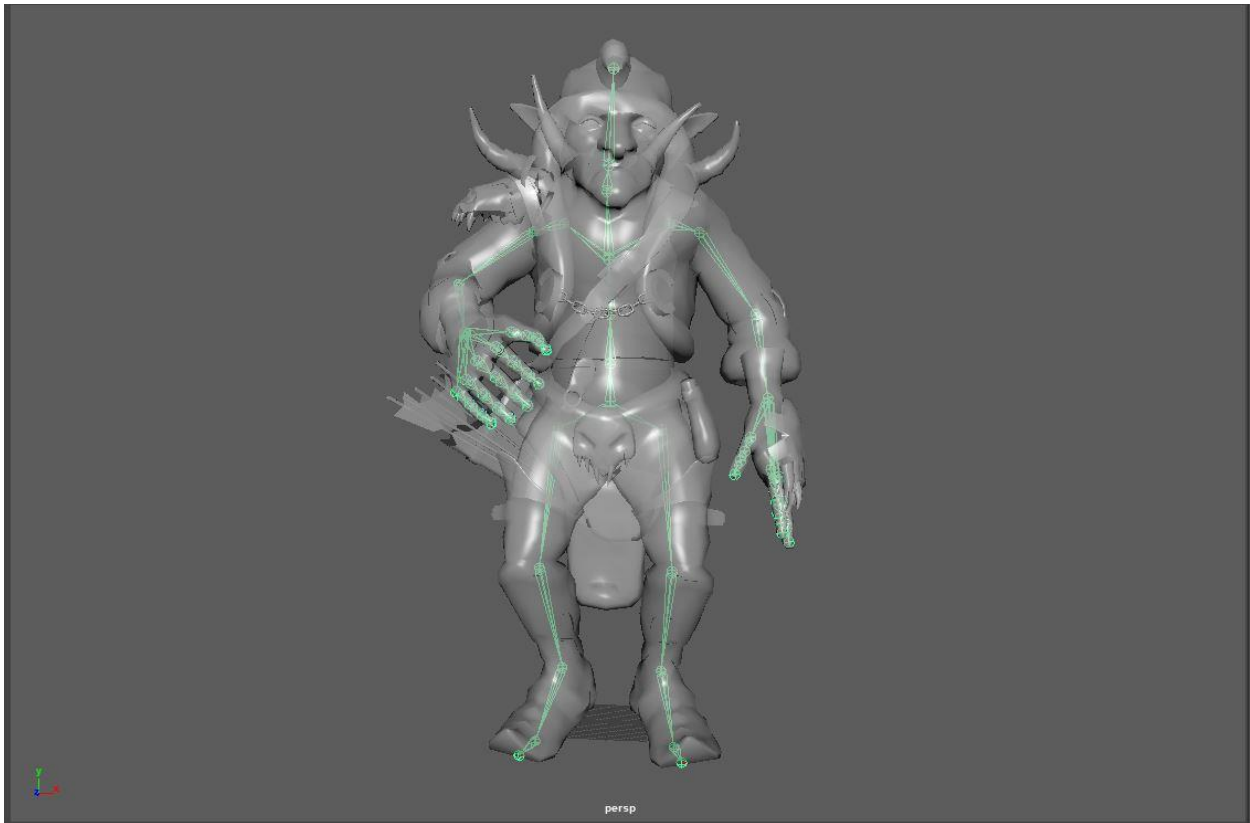


Figure 4.23 Goblin Character Rigging

4.6 Lighting

Following showing the position of Three-point Light setup. where all are Vray Area light in 3DS Max. Though In army character add a background Light also.

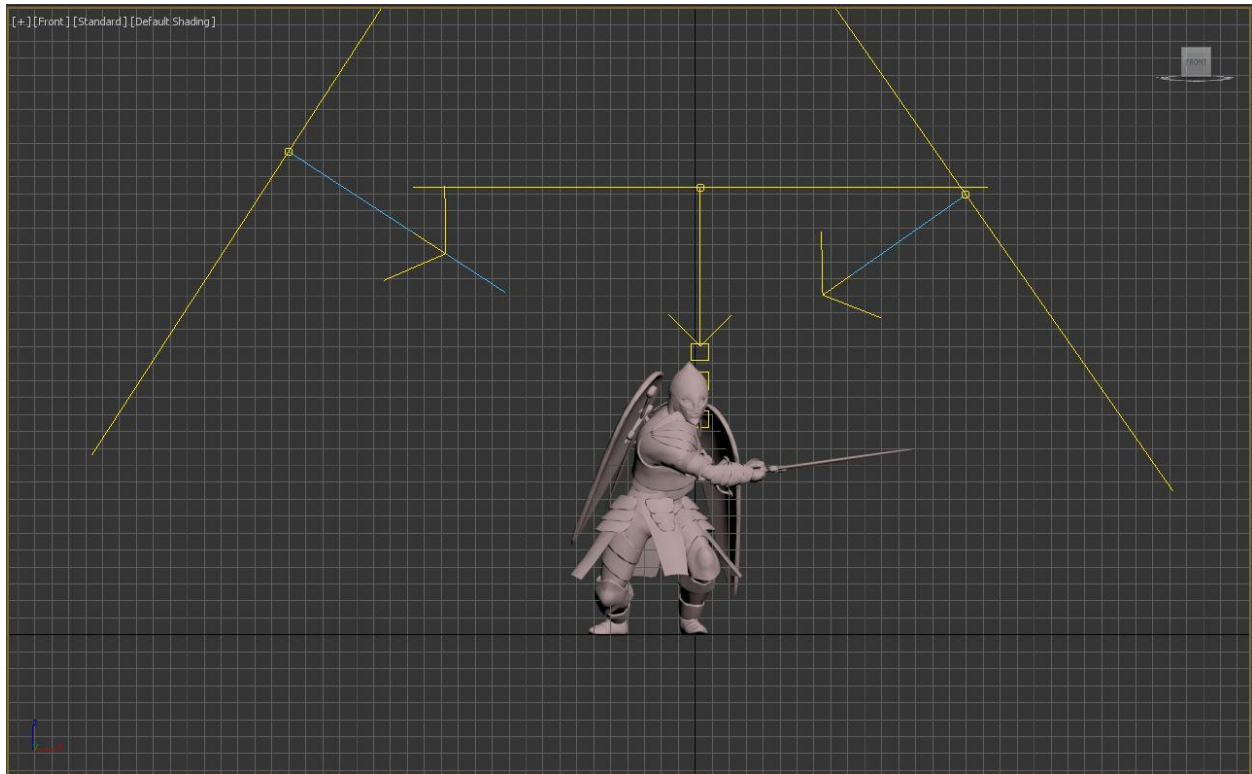


Figure 4.24 Warrior Character three-point Light setup

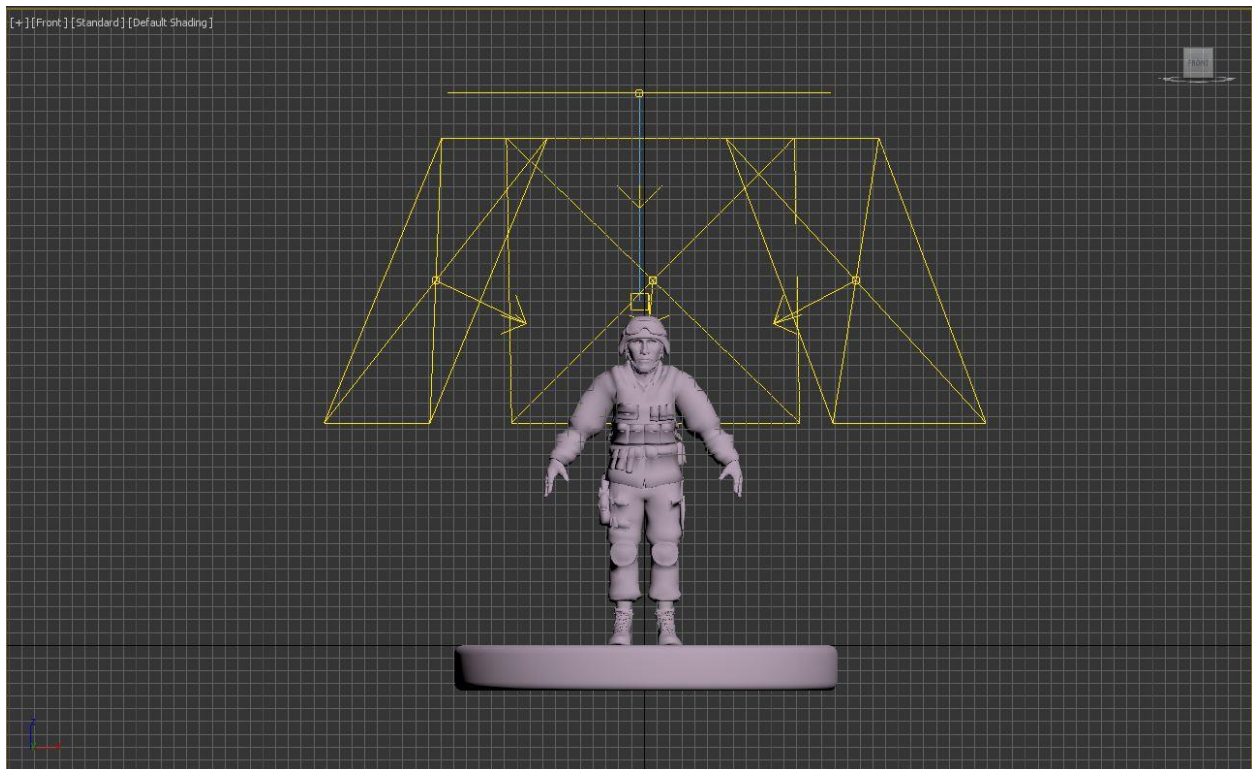


Figure 4.25 Army Character three-point Light setup.

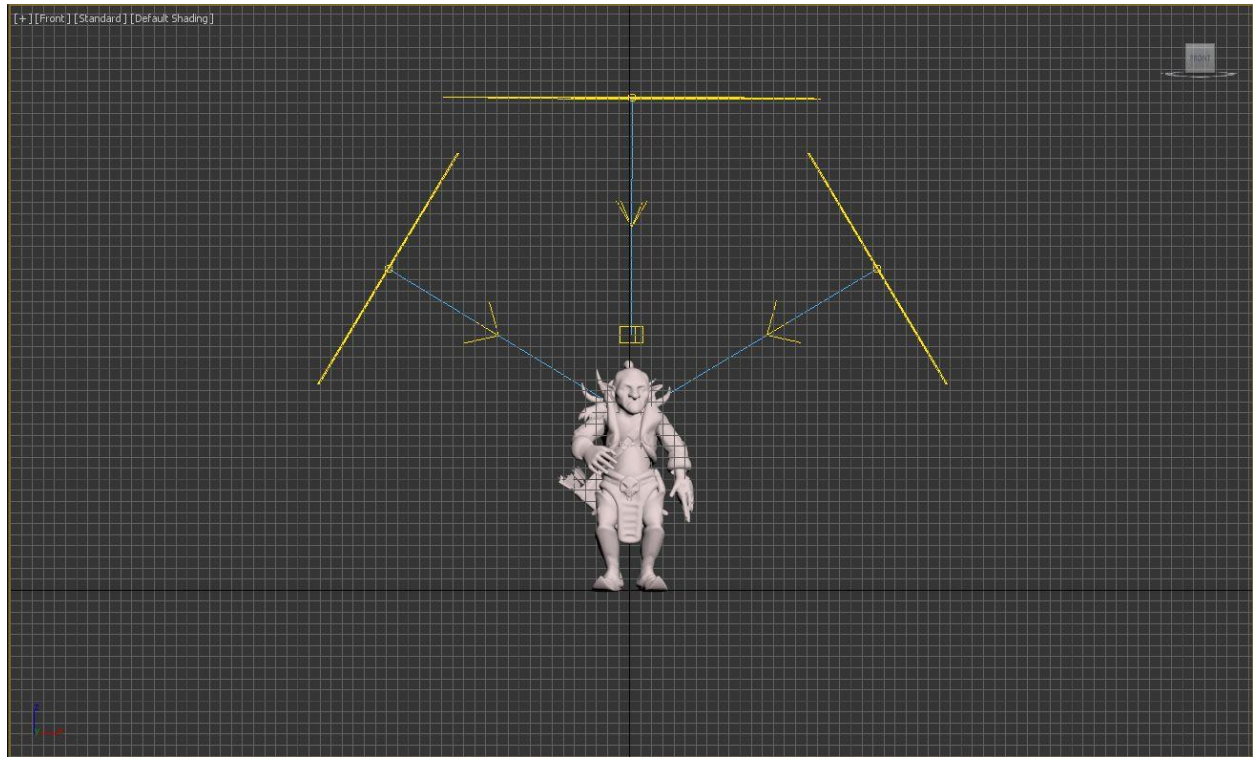


Figure 4.26 Goblin Character three-point Light setup.

5. FINAL RENDERING OUTPUT

Chapter 5 IMPLEMENTATION

5.1 Final output Warrior Character in 3ds Max



Figure 5.1: Warrior render in 3ds max

5.2 Final output Warrior Character in Substance painter



Figure 5.2: Warrior render in Substance painter

5.3 Final output Goblin Character in 3ds Max

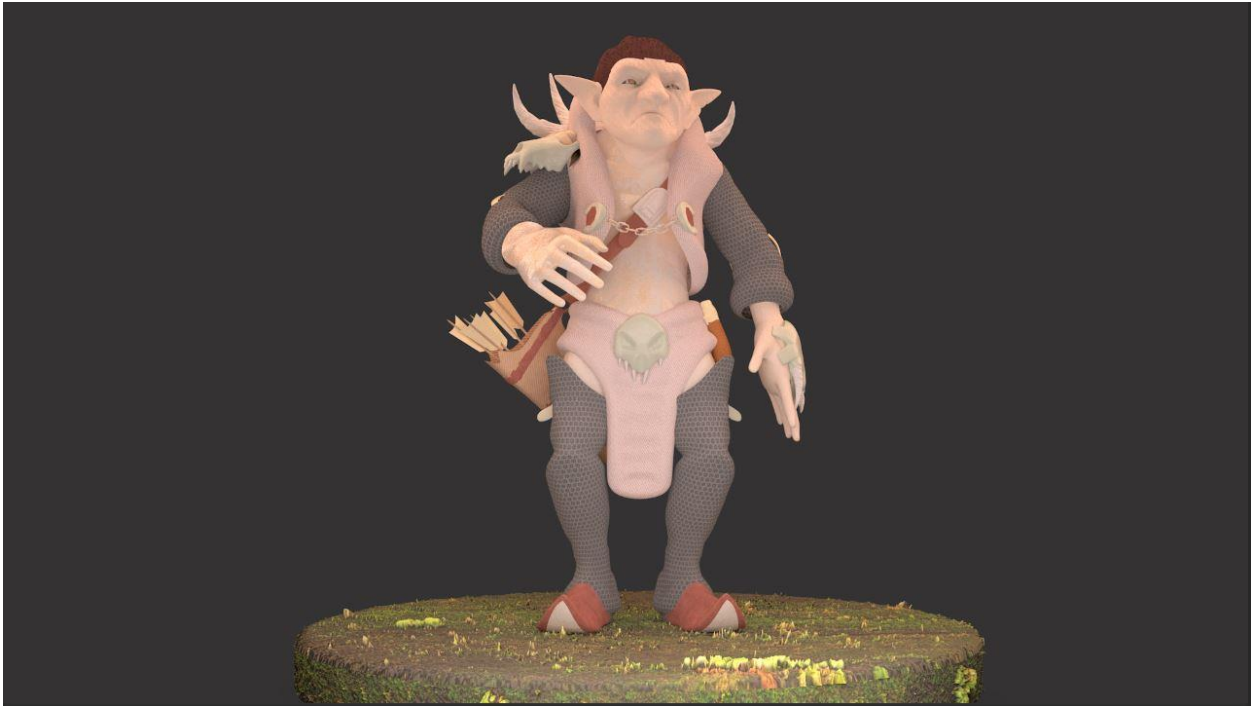


Figure 5.3: Goblin render in 3ds max

5.4 Final output Goblin Character in Substance painter



Figure 5.4: Goblin render in Substance Painter

5.5 Final output Army Character in 3ds Max



Figure 5.5: Army render in 3ds max

5.6 Final output Army Character in Substance painter



Figure 5.6: Army render in Substance painter

5.7 Composition

For Composition all the render *exr file, image file together on Adobe After effect, increase brightness (if needed) and give separate image motion so that audience can satisfy and enjoy, not bored. Then send the whole file to Adobe premiere pro and add title, text, audio etc. for final output.

5.8 Software Requirement

I have used different software like 3ds Max, Maya, After Effect, Premiere Pro, Photoshop, Substance Painter and etc.



Figure 5.7: Software uses on the project.



6. TESTING AND EVOLUTION

Chapter 6

6.1 Introduction

Testing and assessment are the vital step in any application improvement. Testing being done to guarantee that the framework (for this situation the 3D short story movement) made really carries on as the desire for engineer and meets client necessities. This is the fundamental job of assessment. Testing and assessment ought not be thought of as a solitary stage in the plan procedure, yet the things ought to be done in every period of configuration process. The objectives of the assessment in this undertaking is to evaluate that the 3D liveliness usefulness satisfy the goal of the ventures, survey the objective client experience of the 3D movement and toward the conclusion to distinguish the particular issues with the activity being produced. The framework's usefulness tried is critical to guarantee that 3D activity being produced accord with the client's necessities. Be that as it may, in these undertakings, designer just assesses the usefulness of this 3D liveliness and can't survey the client encounter because of time impediment and some different issues confronted. In this way, there is no assessment through client investment in these undertakings. Additionally, testing is vital to distinguish the issue and shortcomings of the 3D liveliness being created so some move can be made to conquer the issues. For this venture, designer separates the testing procedure into three sections that is trying before the improvement of the undertaking, testing amid the advancement of the task, and testing after the last yield of the venture.

6.2 Experiment before developing of project

This sort of testing is to survey and test the equipment that is utilized in the undertaking improvement. It is vital to be led on the grounds that the two components will guarantee the accomplishment of the last items. In term of equipment, Artist ought to decide the sorts of issue that may be faces in the advancement procedure. Engineer should test the ability of equipment; they need to guarantee the task should be possible by their equipment. In this venture, engineer needs the incredible equipment that have the ability to keep expansive limit of information and record, and the equipment that can make a decent designs quality.



In term of the product assessment, testing is directed on the Autodesk 3ds Max, Maya, iClone Software, Mari. Since, the fundamental Software utilized in by and large advancement of this venture, it is imperative to designer to investigate the product. Designer has learned on the best way to utilize the product and following couple of weeks engineer can essentially comprehend the best approach to utilize the product.

Before start the usage stages, designer likewise lead testing on the storyboard of the undertaking. This is to guarantee that designer can understand the storyboard into the 3D movement. Notwithstanding, because of some restriction of the designer, some adjustment has been made to the storyboard.

6.3 Experiment during development of project

As I got the experience from the working Pipeline that,

Softwares all have the advantages and disadvantages at all but it will depend on artist. Each software has particular feature based interface. Artist should consider the work, is that output for games or films? Competable to say according to the texturing softwares, “Substance Vs Mari”, “Mari” is the industry standard for film, and Substance Painter is the industry standard for games. Mari really shines at handling extremely large texture sets, which is an entirely useless ability when making game assets. That means the cheaper and easier to use Substance Painter is dominate in the games industry.

That really depends on what part of industry Artist involve in. “Substance Painter” (and other Substance software) are widely used in game development because they are pretty much easier to use than Mari and are more focused on texturing low-poly models for real-time engines. Mari, on the other hand, allows to use PTEX instead of UVs which makes it suitable for texturing high-poly models used in films and visualization.

There are some other alternatives though. “DDO” was one of the very first tools that allowed to use procedural materials that generated textures based on mesh maps. It later grew into “Quixel Suite” but it didn’t gain as much popularity as the Substance. I don’t think it is supported by the dives anymore though. “3D Coat” is another program that allows to paint with PBR materials.



As it is a whole bunch of tools (texturing, UV, retopology), it is not as elaborate as others but it has its own advantages and pretty fun to use.

So, in my project Substance painter was better choice, As I have the low poly models and got the material library together with layer-based interface so that comparison makes me easier than others texturing based 3D Software's.

6.4 Problems and Suggestion

There are so many problems which I have faced during this project, Need team mate because it's not a solo project. firstly topology problem, it is most difficult if the topology gone wrong. Sceond baking texture exporting normal maps, specular map, difiuse map, ambient occlusion map, perfectly import in the materials shade.

In another software weather the texture is done after that import in the rendering software like 3ds max then it is diffuclt to get the specific result which already done in the texturing software perfectly.

6.5 Project Constraints

Maintain low poly file which contain low mesh, character polygon should not be over limit. As it is a long and brought process from making 3d character to output finalize character so have to divided the work according to gantt chart.

6.6 Recommendation for future development

In future this project can be helpful for thesis about 3d texturing area. As 3d texture play a vitul role in CGI film industry so texturing demand will increasing highly.



Chapter 7

CONCLUSION AND RECOMMENDATION

7.1 Conclusion

Making a 3D display sheet is an errand that requires the Artist complete consideration if the desire to do it legitimately. Making a model sheet where each and every detail adjusts flawlessly on every one of the perspectives is precarious. All things considered, the artist ought not stress excessively over having everything be immaculate as the 3D modeler can settle any disparities

7.2 Recommendation

For doing any kind of recommendation firstly I like to mention a high rendering personal computer will needed along with powerful graphics card for the PC. Because due to rendering the time will less, how much well the component of the computer. Secondly, it contains huge steps. So, the project will better if there will more person then one.



References

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