# Exploring 3D Product Modeling and Game Asset Development through AAVA3D Internship

**BY**

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This Report Presented in Partial Fulfillment of the Requirements for the Degree of Bachelor of Science in Multimedia and Creative Technology

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**DAFFODIL INTERNATIONAL UNIVERSITY**

**DHAKA, BANGLADESH**

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# APPROVAL

This project titled **"Exploring 3D Product Modeling & Game Asset Development through AAVA3D Internship"**, submitted by Md. Rakib Hossain 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 was held on 06 July 2024.
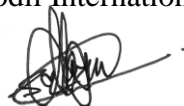
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# DECLARATION

I hereby declare that, this project has been done by me under the supervision of **Arif Ahmed, Professor of Practice, Department of Multimedia and Creative Technology**, 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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# ABSTRACT

During my internship at AAA3D Studios within the MCT (Multimedia and Creative Technology) department, I engaged deeply in the creation of 3D models and AAA game assets, focusing primarily on Autodesk Maya. Over the course of six months, I successfully completed over 15 diverse 3D models, demonstrating proficiency and receiving commendable feedback from AAA3D Studios.

The internship experience was structured to provide a comprehensive understanding of the entire 3D production pipeline. This encompassed initial stages such as storyboarding and conceptualization, followed by meticulous tasks including modeling, texturing, animation, lighting setup, rendering, and post-processing. Each phase was crucial in refining my skills and understanding the nuances of crafting immersive and visually compelling 3D content.

Collaboration with AAA3D Studios allowed me to immerse myself in professional workflows and gain practical insights into client expectations and project management in the competitive marketplace. This exposure not only sharpened my technical abilities but also enhanced my ability to communicate ideas effectively through visual media.

Overall, my internship at AAA3D Studios has been instrumental in advancing my proficiency in 3D modeling, game asset design, and understanding the complexities of professional 3D visualization projects. It has equipped me with invaluable skills and experiences that are essential for a successful career in the dynamic field of 3D animation and visual effects.

In the past six months, I have completed 15 projects and received positive feedback from the AAVA 3D studio. I am now confident in my ability to create any product or game asset using Autodesk Maya software.

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# CHAPTER 1

## INTRODUCTION

In today's digital age, the field of 3D modeling and game asset design stands at the forefront of technological innovation and creative expression. As a student in the Multimedia and Creative Technology (MCT) department, my journey into this dynamic realm has been shaped significantly by my internship experience at AAA3D Studios. Over the course of my internship, I engaged deeply in the creation of diverse 3D models, ranging from intricate objects like a 360-degree camera and Motorola radio to culturally significant items such as Bangladeshi old oil lamps and military radios.

This report delves into the comprehensive process of modeling these 3D assets, providing detailed insights into the methodologies, techniques, and creative decisions involved. Each model presented within this document represents not only a technical achievement but also a testament to the fusion of artistic vision and practical skill development cultivated during my tenure at AAA3D Studios.

Through rigorous exploration and hands-on application of software tools like Autodesk Maya, I endeavored to capture the essence and functionality of each object while adhering to industry standards and client specifications. This report serves as a comprehensive documentation of my learning journey, highlighting the challenges encountered, solutions implemented, and lessons learned in the pursuit of mastering 3D modeling and game asset design.

# CHAPTER 2

# CASE STUDY

This case study explores the transformative journey of me, a student from the Multimedia and Creative Technology (MCT) department, during my internship at AAA3D Studios. This project that I have to study a lot because here I work with product modeling and AAA game assets. I model game assets and products according to the current market.

I came here thinking about the current situation. To complete this project, I will learn many things there are I improve my modeling skills, light and also substance texturing. This is not easy for me. I search a lot of resources and watched lot of tutorial for our skill improvement. AAA game assets require a lot of high quality renders that I put a lot of hard effort into.

My internship experience at AAA3D Studios proved instrumental in shaping my skills and aspirations in the field of 3D modeling and game asset design. This case study underscores the importance of hands-on learning and mentorship in nurturing talent and fostering creativity within the digital media industry. My journey serves as a testament to the transformative power of practical experience and dedication in mastering the complexities of 3D modeling and visualization.

# CHAPTER 3
# TECHNIQUE & METHOD

**TECHNIQUE & METHOD 3.1**

In this chapter, I will discuss the software and the techniques. I have used to execute this project along with the methods I adopted for increased efficiency.

**3.1.1 AUTODESK MAYA:**



Figure 3.1.1: Autodesk Maya

Autodesk Maya is a professional tool for 3D computer animation, 3D rendering, and 3D modeling; it helps create the best visual effects, animated films, and series for television. Throughout most of its 23-year lifetime, it has been regarded as the industry standard. It finds a range of applications due to configurable workspaces that let users set up the software on their workflow basis. The polygon, NURBs, and sculpture modeling tools of Maya are supplemented with a UV editing tool to give 3D modeling capacity, although it distinguishes itself with a bewildering array of animation and rigging features that go beyond basic modeling. I used Autodesk Maya in this project for the stylized 3D assets, mainly created with its polygon, NURBs, and sculpting tools, and rendered using Arnold. Reference: Autodesk. Maya Overview.

### 3.1.2 Z-Brush:



Figure 3.1.1: Z-Brush

Z-Brush is widely regarded as the most advanced digital sculpting software in the industry today. It gives professionals involved in filmmaking, game development, conceptual arts, and illustration the ability to sculpt and paint virtual clay in real time. By offering many customizable brushes that feel and act like traditional media tools in the real world—Brush automatically adds more polygons only when needed it's an extremely smooth, high-resolution sculpt. These enable you to combine, subtract, and intersect independent shapes to form complex models. Besides, the interface can be customized to one's favorite workflow; hence, making one comfortable and efficient in their working environment. Z-Brush uses game developers to design characters, environments, and props. In general, Z-Brush appears to be a very impressive tool that assists artists in creating amazing works or detailed 3D models. References: School of Motion.

### 3.1.3 ADOBE SUBSTANCE PAINTER:



Figure 3.1.3: Adobe Substance Painter

Substance is a suite of procedural texture tools developed by Allegorithmic, a French software company acquired by Adobe in January 2019. This technology is widely used in

computer animation, design, cinema, and video games. Substance 3D Painter, the standard 3D texturing program, is utilized in game development, film production, product design, fashion, and architecture, offering designers full creative liberty.

### 3.1.4 CHAOS V-RAY RENDER ENGINE:



Figure 3.1.4: V-ray Render Engine

V-Ray is a rendering engine that utilizes global illumination technologies, such as route tracing, photon mapping, irradiance maps, and directly calculated global illumination. This program is used to produce images in real-time, delivering fantastic results despite the lengthy rendering time for each frame. Reference: ChaosOfficial

### 3.1.5 MARMOSET TOOLBAG 4:



Figure 3.1.5: Marmoset Toolbag 4

Marmoset Toolbag 4 is an all-in-one suite for 3D artists focused on the gaming industry mainly. It brings rendering, texturing, and baking all into a single application. It offers both raster and ray-traced rendering methods, hence helping in previewing the results, and also has the final high-quality render with photo-realistic lighting effects. Customize the user interface to suit your preference for improved productivity. Marmoset Toolbag 4 is much more than that: it's a powerhouse for creating top-of-the-line game assets and real-time

rendering combined with a streamlined workflow. Reference: Marmoset. (n.d.). Toolbag 4 Overview.

**3.1.6 ADOBE PHOTOSHOP:**



Figure 3.1.6: Adobe Photoshop

Adobe Photoshop is one of the popular raster graphics editing software that has extensive usage in respect to image editing and designing, digital art. It uses layering to provide depth and flexibility for design or editing a work and has powerful editing tools which do almost everything when combined together. In this project, I have used Adobe Photoshop for combining reference images to create templates for modeling. Moreover, I have also prepared rendered images to be presented in Photoshop. Reference: Adobe. Photoshop Overview.

## 3.2 COMMONLY USED TECHNIQUES

In this section, I have covered the most popular techniques used in modeling products and game assets. On their own, these techniques are very popular; together, they will provide us with an excellent set of tools to speedily and easily come up with beautiful, high-quality 3D models.

### • LATTICE DEFORMATION

A lattice is entirely a point structure that can help one in performing free-form deformations to any tensor field. The object can therefore be deformed by either translation, rotation, or scaling of the structure of the lattice or point-wise by manipulating the defined lattice points. Such a way of deformation by lattice is often very useful for controlling the shape of the object. In this project, I employed lattice deformation to make huge changes in a shape of an object and broke the symmetry.

### • BEND DEFORMATION

The Bend deformer allows you to bend any deformable object in a circular arc. They are also useful in both character creation and modeling. Bend deformers have handles that turn on and off to let you intuitively control and manipulate the amount of bending effect and curve. In this project, I used the bending deformation to involve and stylize objects in different ways.

### • MULTI-CUT TOOL

The multi-cut tool in Maya allows us to cut, slice, and insert edge loops efficiently. In Smooth Mesh Preview mode, we can extract or delete edges along a cut. Also, we can insert edge loops and cuts with edge flow and subdivisions, edit. I used the multi-cut tool in my modeling process in a handier way for inserting edge loops. It has made controlling the outlook of the model very easy by providing proper edge flow and a level of bevel.

## • SLIDE EDGE TOOL

We can use transform constraints from the modeling toolkit to move a subset of components along their existing edges. Later on, this is very good for reorganizing or straightening edge loops and vertex flow without marring the surface; it works with the move, rotate, and scale tools. The Slide Edge tool allowed me easy edge shifting along a surface without any drastic changes.

## • SOFT SELECTION

Soft selection is a way to select and move around vertices, edges, and even faces UV or multiple mesh in a very organic and fluid method. It's very good to create perfect, smooth slopes or contours without needing to transform each vertex individually. In this project, I used soft selection to move around vertices and faces when I wanted to add some irregularities and variations to my models.

## • MIRROR

The Mirror command duplicates a mesh and reflects it over the invisible mirror plane. This geometry can be regionalized and manipulated later by placing this plane manually. We can mirror a mesh when we need to construct something which is completely symmetrical but we don't want to use twice the amount of time performing the task for which we need it. I used the mirror tool quite a lot during my project in order to quickly build up the object before moving on to break its symmetries.

## 3.3 METHODS FOR INCREASED EFFICIENCY

In this section, I'll go over the methods that helped me create a quicker and more effective workflow for watching Simon Fucks (Military Radio) Tutorial.

### • CUSTOMIZED SHELF

Autodesk Maya gives its users the opportunity of creating a custom shelf with any tool, action, menu item, or script of their choice. A custom shelf saves us a lot of time by allowing us to rapidly access the tools and options we use frequently.

For this project, I have created a custom shelf for myself and added all the tools and actions. I needed to model game assets efficiently including Boolean, Hard & Soft Edge, Align, Latice, Mirror, UV, Hard Edge Selection, Smooth, Unsmooth, etc. to establish a productive workflow.



Figure- 3.3.1 Custom Shelf Maya

Z-Brush allows its users to create a custom shelf with any tool, action, menu item, or script of their choice.

For this project, I have created a custom shelf on Z-Brush and added all the tools and actions. I needed to model game assets efficiently including Auto Group UV, Group Visible, Grow Mask, Shrink Mask, Sharpen Mask, Mask by Feature, Polish, Export Obj, Import Obj, etc. to establish a productive workflow
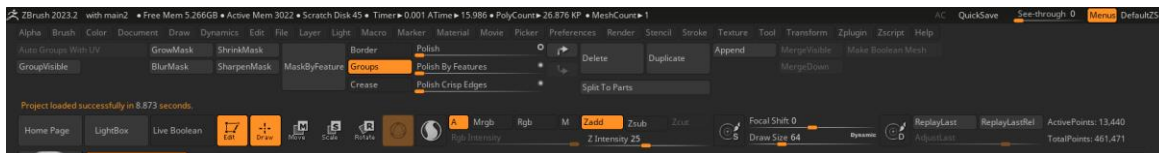


Figure- 3.3.2 Custom Shelf Z-Brush

• **GROUPING**

Grouping is the best way to conglomerate the elements of a complex asset or a scene. It makes it easier to track and select elements. We will group under subgroups, different parts of an asset, for example, all under one main group.

For example- I used grouping for game asset project helping low poly and high-poly baking.

Something like this-

• Final Model Group

• High-poly group

• high_01

• high_02

• high_03

• Low-poly group

• low_01

• low_02

• Model Group

• model_01

• model_02

We can then choose any of these elements individually and move around any of the groups in an organized fashion with the help of those up and down arrow keys on the keyboard. It is very time-saving because it enables us to pick up any element and move it around with great swiftness.

# CHAPTER 4
## PROJECT WORKFLOW

### 4.1: MODELING:

3D modeling involves manipulating polygons, edges, and vertices in virtual 3D space to create representations of surfaces or objects. This technique is widely used in movies, cartoons, and video games to create unique and original animals and structures. The impact of 3D modeling is extensive, enhancing visual storytelling and interactive experiences.

For our project, we have chosen Autodesk Maya 2024 as our modeling program. The game's standard primitives include boxes, spheres, lines, and cylinders. We used various adjustments to build several models using this approach. Key tools and techniques employed include Extrude, Insert, Bridge, Combine, and Nonlinear tools such as Bend and Lattice. It was crucial to maintain all polygons in the models as quads during the creation process.

This detailed workflow should provide a comprehensive overview of your 3D modeling process using Autodesk Maya 2024. Below is a summary of all the models I created and their various applications.

**4.1.1: BLEU DE CHANEL PARFUM:**

Bleu de chanel perfum is the name of the product. This product a reference photo were sent to me. Then I got a box of the same size and started modeling within it to get the dimensions right.



Figure 4.1.1: Reference of bleu de chanel perfume

At first, I took a box and then beveled the box corner as a reference image, then the bevel corner and another corner. I added 2 supporting edges for smooth preview seeing. Then top side of the perfume I need a circle shape for extruding the perfume cap and adding a spray button. So, I used the circularize option from Maya and added 2 edges for circularize. Then I little bit extruding the cap part as a reference. Then I took a cylinder shape from Maya and matched his size as a reference image and our creating object. Then that cap maintains sharp corners I need supporting edges. I used the bevel and option box selected 4 segment. Actually that can feel me more realistic. After create all of this object I'm smoothing all the object for realistic feels.
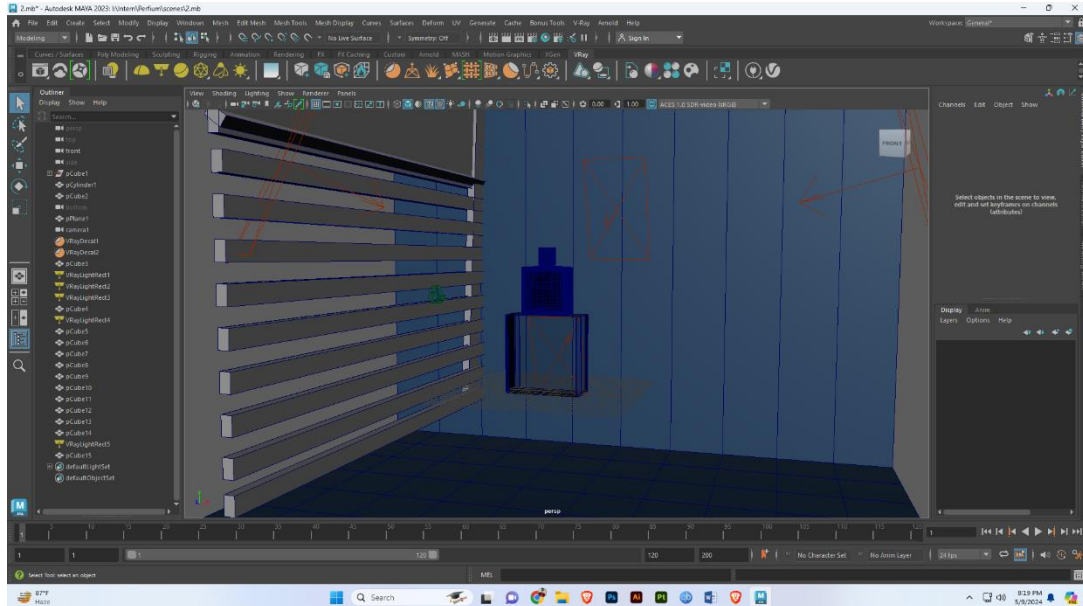
Figure 4.1.2: Wireframe of Bleu De Chanel Perfume

After completing the model I create an environment. So, first of all, I need a background. So, I took a plane and made a wall of this object. And to give a vray wall mtl, changing color blue. And object used glass mtl. Perfume used bluish glass mtl. And also I create this perfume logo and text in Photoshop. Then I replace this with V-ray decal.

Then I create a 3-point lighting. Also, window lighting I create a box shape window. Then I directional light sent to outside of the window.

Then I took a camera and perfect framing focusing & highlighted this object. Then I create a v-ray render setting and rendering it. After render output bellow. Thank you.

Figure 4.1.3: Final Render of Bleu De Chanel Perfum

Here is my final output of Bleu De Chanel Perfum and client are satisfied in this output and Client are approve this model.

I faced some problems while doing this project. There are lighting issue and material issue. But I am trying hard to bring it to this desire outcome. And with this project I learn advance lighting technique and grow our level.

**4.1.2: LOGITECH 360º CAMERA:**

This image provide me client. I got the client measurement and they told me that can uses a website for product visualization.



Figure 4.1.4: Reference of Logitech 360º Camera.

At first, I take a cylinder shape. And on top of the camera for a round shape, I took a sphare and Boolean it. And marge vertices from the target weld tool. The font side needs a Boolean to make it. So I used a box shape and box bottom corner bevel for curving segments need 8. I Boolean it properly as can I see the picture. Done my camera shape coming that Boolean and I fix the topology. Besides the camera hole, I need to circularize and then extrude up.
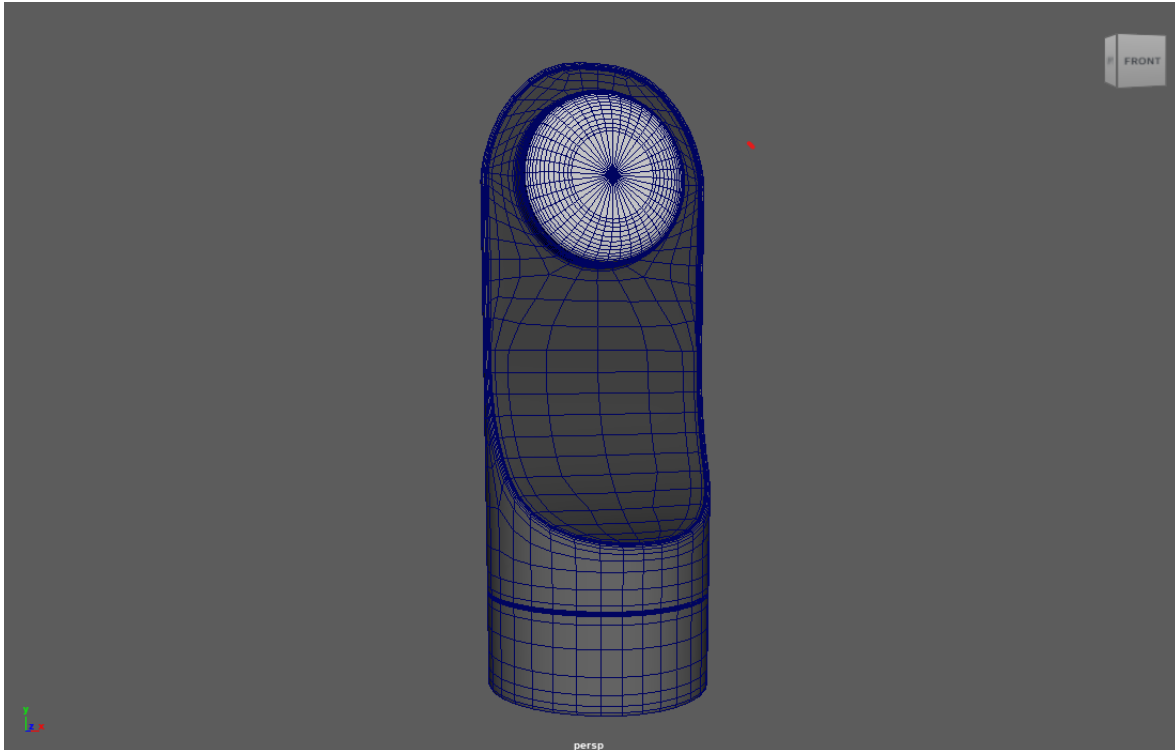
Figure 4.1.5: Wireframe of Logitech 360° Camera

Then I take a sphere for the camera glass. And inside the glass, I make a camera lens a sphere, and a cylinder. Bellow the camera I need a small minus extrude as we can see reference image. After that all of the sharp edges I added supporting edges. Then I smoothed all of them.

After completing my model I managed the Logitech logo online. Then I created the UV and sent it to the 3D substance painter. And creating a texture as we can see reference. Then exported back to Maya and connected the camera texture from a texture map. Then I'm lighting this model v-ray and Render it. Then I create some post production work in Photoshop.

After complete the work I rendered v-ray. My output was bellow Thank You.

Figure 4.1.6: Final Render of Logitech 360º Camera

Here is my final output of Logitech 360º Camera. It's fulfill client requirement and I reached satisfactory level. Client are very happy with this output.

**4.1.3: MOJO SOFT DRINK CAN BY AKIJ FOOD BEVERAGE:**

It was a client project animation mojo soft drink can. I have listened to all the client's requirements. Actually it's a TVC project.
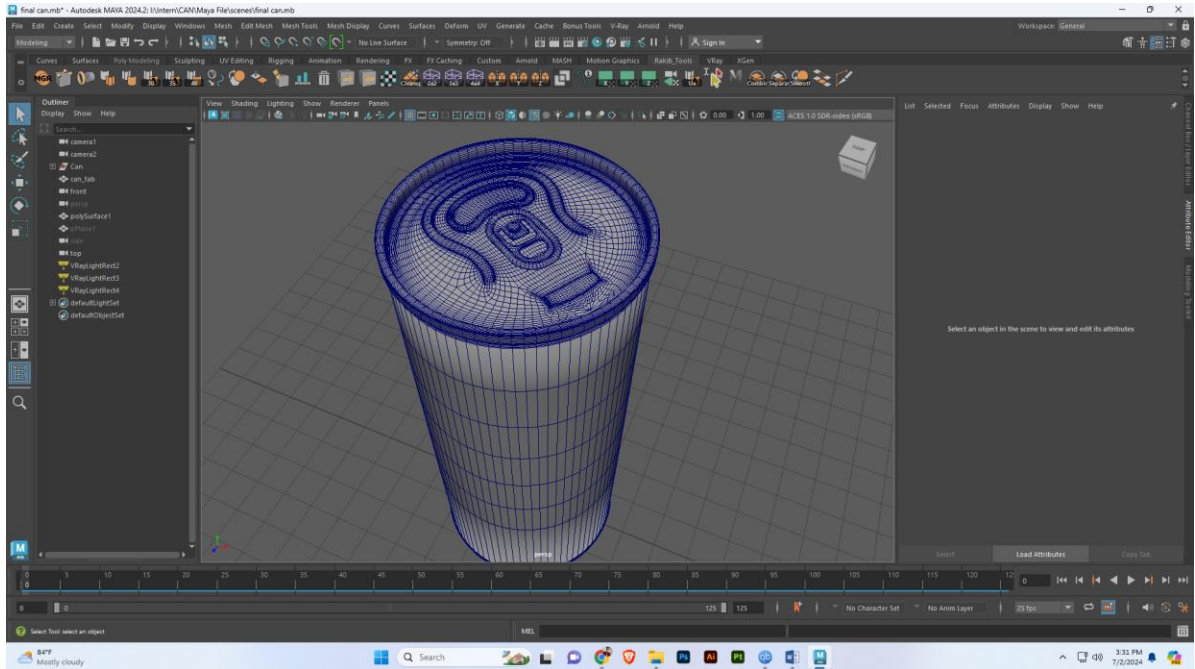


Figure 4.1.7: Final Model of Mojo Can

First I bought a can of Mojo soft drink. Then I start its model in Autodesk Maya 2024.2 version. First I toke a cylinder to create a block out shape in this model. And I take it measurement for this shape by using my previous bought Mojo can.

I take the edge of the cylinder as much as it needed. Then I make the top part. I used Quad draw tool to make the upper part. One of the frequently used advanced functions of Autodesk Maya doing re-topology is the Quad Draw tool. Re-topology is the rebuilding of the mesh of a 3D model in order to enhance its quality and efficiency. I finish the top part with Quad draw tool. And under the can I make it minus extrude of vertex point.

And I texture the model in adobe substance 3d painter. In this texturing part I use mojo can logo, mojo can BSTI permission logo and other things.

Figure 4.1.8: Substance texturing Base color of Mojo can

Then I rendering this model V-ray for Maya 2024. I assign the texture in this model from a v-ray mtl.



Figure 4.1.9: Final Render of Mojo can

This is my final output of mojo can. And I approved our client finally I do the animation. There I create four types of key frame animation.
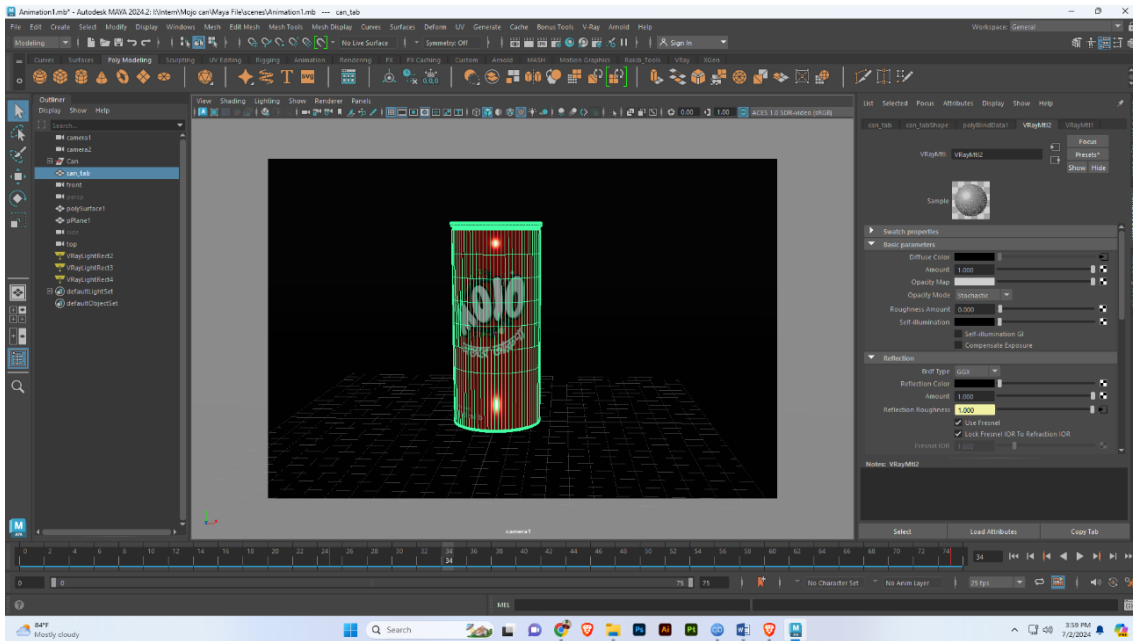
Figure 4.1.10: First key-frame animation of Mojo can

I create lighting for this scene. I choose the lighting for this scene dark color background. The dark lighting went very well with the Mojo can. So, I finally create this can animation with dark lighting and background.

First shoot in this animation mojo I animate the can moving 25 frame 75 frame forward. After completing my first animation. I rendered this project video ratio I select 1920*1080. Then I start rendering for first part of animation. Almost 3 to 5 hours latter finished my rendered.

Then I composition this file. For composition I used this project Adobe Premiere Pro 2023. Finally finished my first part.

For the second part of animation I choose the top part of can. So, this part I am showed can top part rotation animation. Below I am giving a rendered image of top part rotation that I create successfully.

Figure 4.1.11: Final Render of Top camera animation

And I create of third part of this animation project a turntable animation. Basically turntable animation is a turntable animation is one of the techniques used in 3D animation whereby an object is virtually rotated against a central axis to give a perfect view of the object in every side and details. This is something similar to placing any object on a turntable and then spinning it around to get a view at 360 degrees. It works object focus, rotation and looping animation. It is very popular also for TV commercial.

Finally I composition this project Adobe Premiere Pro and also I correct in color correction of this project. And I cutting and decorated the project finally and also adding a background music. Finally I rendered in Adobe Premiere Pro.

I send the project my team leader he through the client. And project was approved the client.

### 4.1.4: SVIETTO BODY-SPRAY:

This is a reference image of a client. Actually he has need this body spray image for upload marketplace. I toke the image size measurement.



Figure 4.1.12: Reference of Svietto body-spray

First I create this model a cylinder shape. Then this cylinder I modified first I need some edges for modification this model. After toke edges I used minus scale to create this model properly and some edges minus scale then I extrude my top part of model for cap. Under the cap part I need minus extrude to match up our reference image. Then I create bottom part I need some extra edges for bottom faces. I take some extra edges I modified from minus extrude.

Finally I create the model then I used UV for Autodesk Maya default auto UV. Then I take away this model Adobe Substance Painter for texturing.

After that I textured the model in substance painter. I managed the model logo from google then I textured.
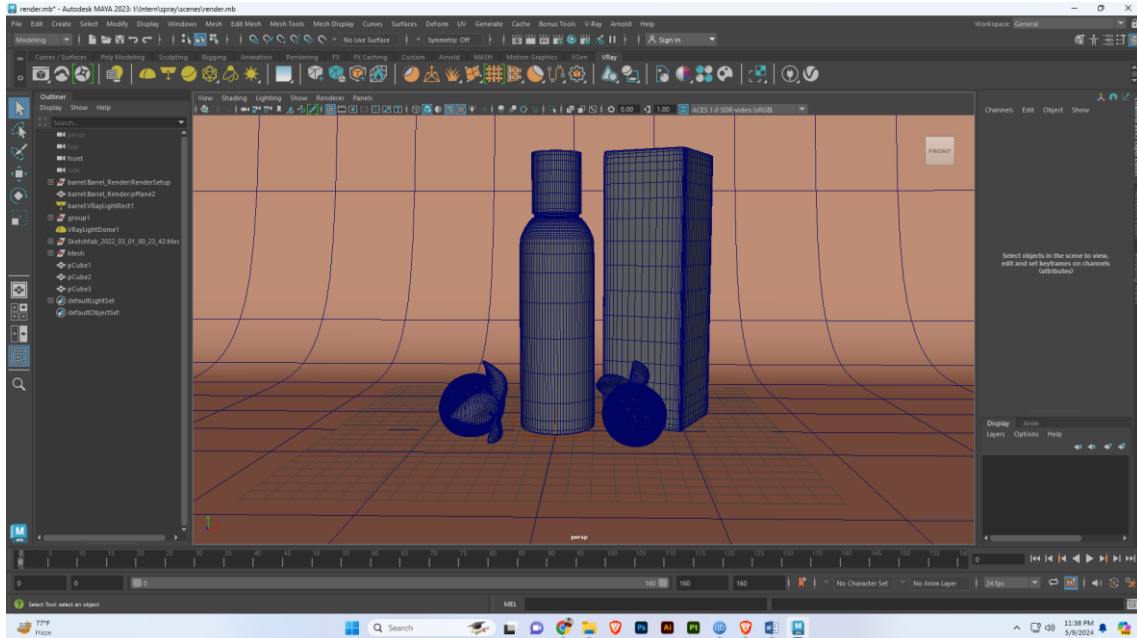
Figure 4.1.13: Wireframe of Svietto body-spray

Here is my complete my model. I also create a box shape for body spray box design. And I download some orange model online marketplace. Then I create a background for our render image background with a plane. I added some extra edges for curving background and batter render output.

Then I take the texture file that I already create in Adobe Substance Painter. Then I create a V-ray mtl for importing textured my model. Then I attached the textured file in this mtl and I assign my model. Done my modeling work.

Then I take some lights, I used three point lighting in this project. I fix the light position and light brightness. After I finished my lighting I go to next part of rendering.

I setup my render settings and maintain client image measurement fixup all. Then I started my render. After 1 hours finished my render.

Attached my output bellow.

Figure 4.1.14: Final Model of Svietto body-spray

This is my Svietto body spray project final output. Then I sent it for this project client. But client hasn't approve. Some correction giving to me. And said also color change the body spray orange to black.

So, I started my work. I deleted some element from recent project. Then I export in FBX format for substance painter texturing. Then I create the texture orange to black. Then I exported it.

After that I imported texture in Maya then I change the background color orange to black after complete my all of correction then I another rendered it properly. Under bellow I attached my corrected render images.

Figure 4.1.15: Final Render of Black texture Svietto body-spray

This is my black texture render image. It is better than first rendered. Then I send it our honorable client. And they approved this project and comment satisfactory level. Finally I finished my Svietto body-spray project.

**4.1.5: SERUM PRODUCT:**

This is another product modeling project. I take this reference image from client and listened all of the requirement that he needed. I take his company logo and they provided it.



Figure 4.1.16: Reference Image of Serum Product

After that I start to create this model first. I create this model a cylinder shape. I take a cylinder with proper subdivision. Then I create cylinder upper part minus scale for curve this as a reference images that can I saw. After that I extrude this little bit up cylinder and curving. Then I extrude outside top part for cap. Then I take another cylinder for out cap part modeling. This cylinder I fix the position and bevel the top part of cap then I extrude down and extrude outside for accurate our reference image. And I also create a pipe for inside serum bottle.

After completing my model part I create my background environment. I take a cylinder for decorated our scene reference image. And I download some elements and make a wall and floor for a plane. Bellow after completing my scene screen shoot.
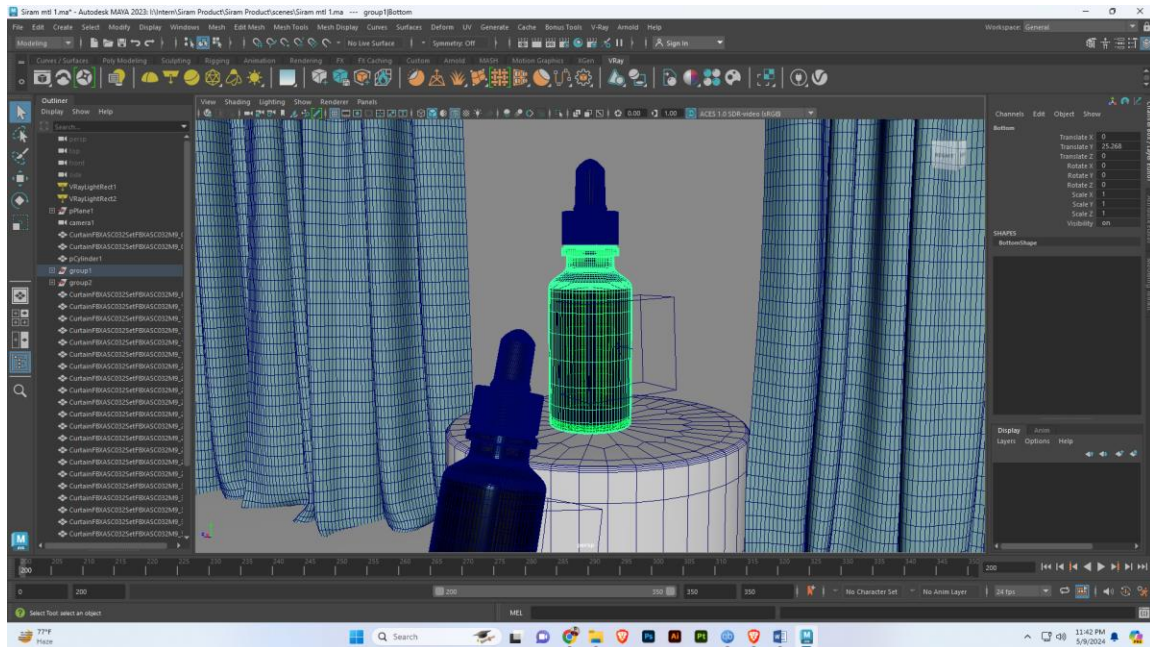
Figure 4.1.17: Wireframe of Serum Product

Here is my wireframe of serum product. I all of the done this time. Then I create a three point light.

And assign two material. One of my serum product body part and one cap part. I create two materials. One material I use plastic transparency and one black rubber. Then I assign this model. Also I take a v-ray decal for logo replacing. And fix the decal position.

After completing my all of the work. Then I started my rendering setup and rendered it. Rendering time almost 1 hour. It's a 4k images.

I attached final render image bellow.

Figure 4.1.18: Final Render of Serum Product

Finally I create my desire output. Client approve this project. We fulfill client requirement and good feedback. They satisfied with this result.

**4.1.6: 3D LOGO TITLE ANIMATION FOR AAVA3D:**

This project for AAVA3D promotional animation project. I take avva3d logo from our team leader.First I create this logo image vector in illustrator. Then this logo export to svg for working a logo shape in Maya. Because Maya does not accepted any Ai file or Jpg file.
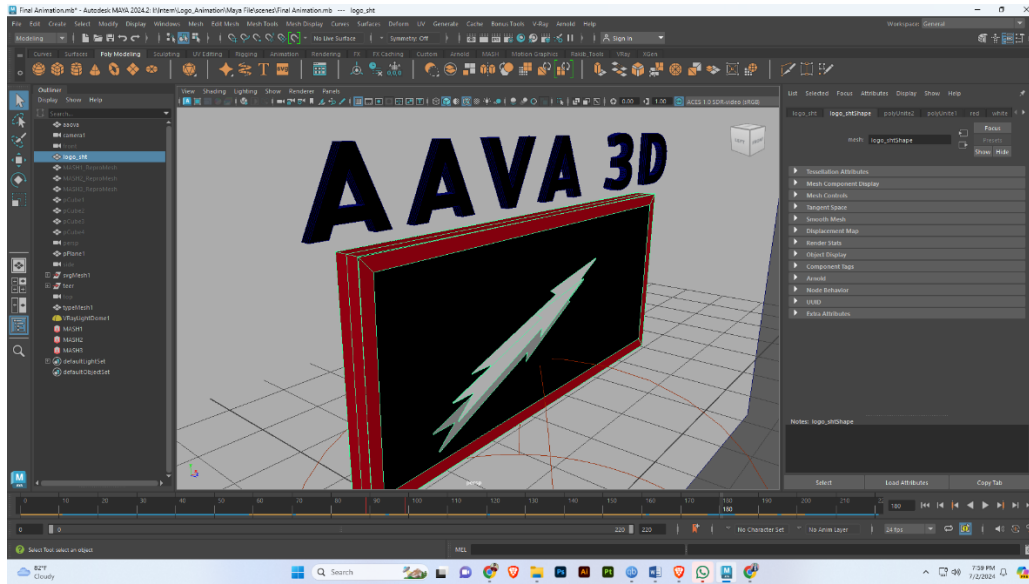


Figure 4.1.19: AAVA3D Logo In Maya

I imported svg file in Maya and I extrude this. So finally I create a 3 dimensional shape logo. Then I create a material from logo color. I create material red, black and white. Now we need to decide what's the shape that we're going to be using and I think box are pretty cool. Many boxes together will form a logo animation.

So we create a base box. It's a basically Maya mash logo animation. Then I select the box and click on Mesh from Maya shelve and select Mesh. Then Mash file inside I input the model of my logo. Now, I see that box shape create the logo. Then I increased number of points on my mash folder. I increased 10,000 value for mash number of point. I saw inside the logo lot of boxes.

And last part we added a note from our mash shelve Random note. This note actually help me for animation. This note works randomly move position. I set e key frame my last and set a key frame for the first and change the Random note value. Given below my image my shown this type.
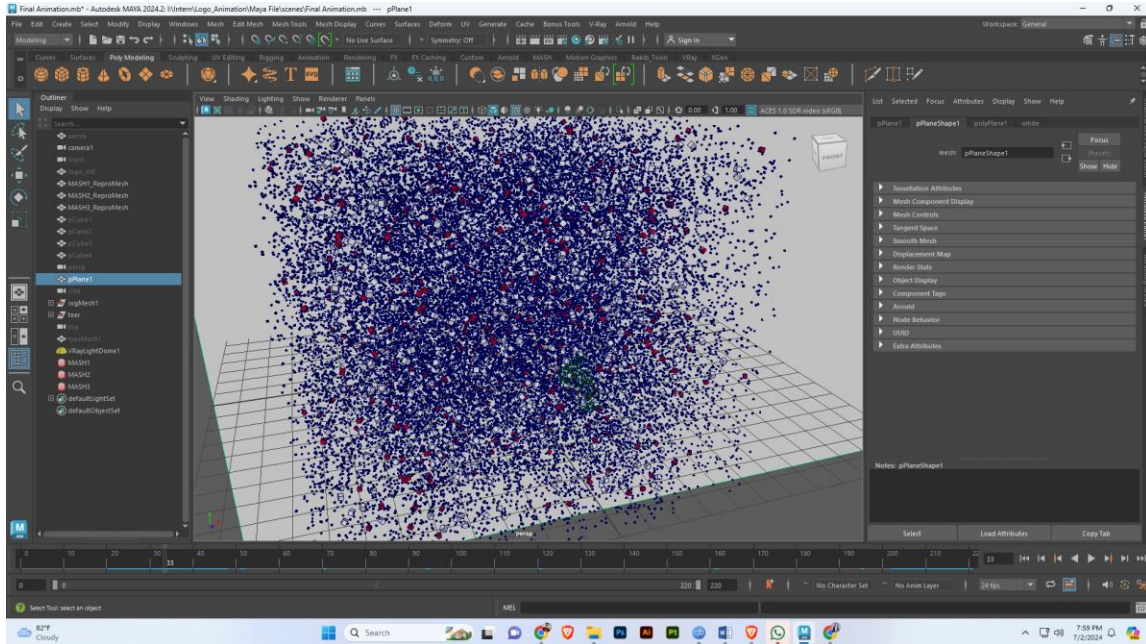
Figure 4.1.20: Mash Logo Animation

Then finally set our key-frame position. And create a camera for proper view shown this.

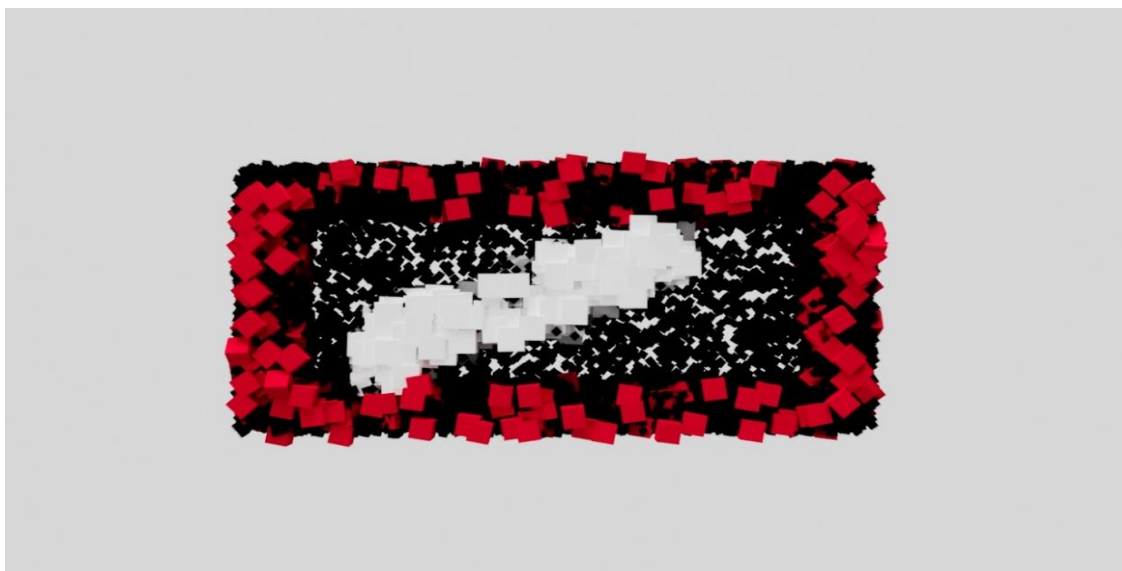Finally I create a simple lighting. And render this project.



Figure 4.1.21: Mash Logo Animation

This project approved by Hasan Mamun, COO in AAVA3D.

**4.1.7: FRESH WASH:**

This is a client project. Client sent me a reference images of his product type. I take the logo of his product.



Figure 4.1.22: Reference of the fresh wash

First I create a model of this fresh wash. First I take a cylinder on my project. Then I take some edges that I need. Under the fresh wash I go to soft selection mode in Maya and also vertex mode. Then I selected under side vertex minus scale it. And last bottom part selected and to mixed one to another. And striped creating in texturing part. And top part I take a cylinder and cutting my cap part and little Boolean for creating deeper shape. Finally I adjust another part and complete the model. And pressing smooth in Maya.

And also I create a window shape by a box. It's my fresh wash background. Here is my fresh wash wireframe model screen shoot.
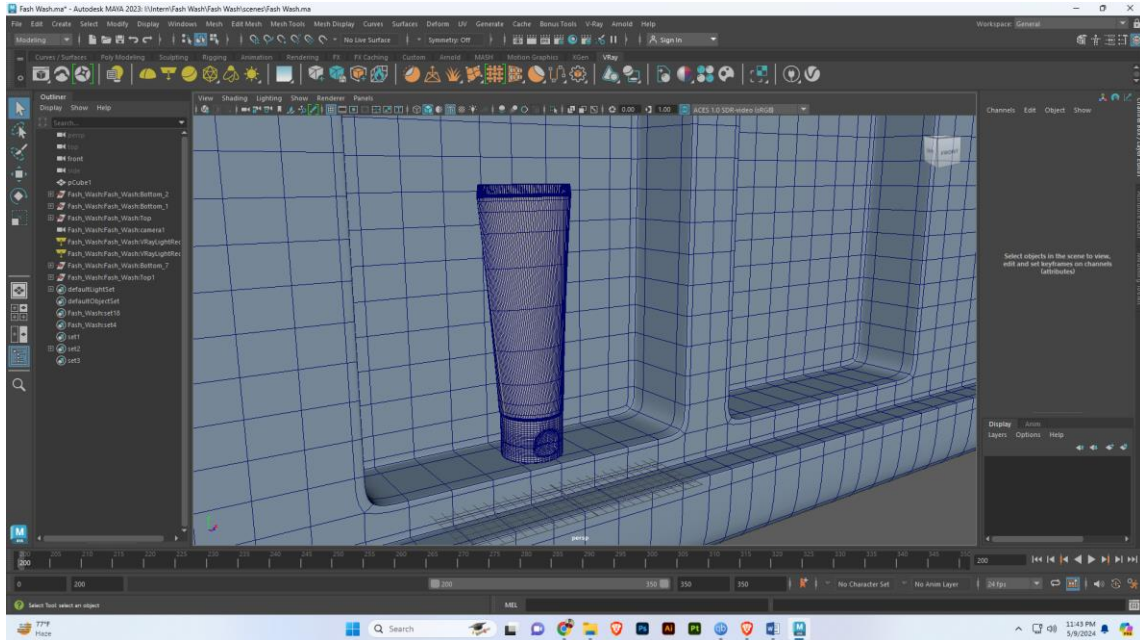
Figure 4.1.23: Wireframe of the fresh wash

This is my wireframe of the wash. I complete successfully to create this model. And finally I create texture. Also I create Auto UV in Maya. And all of this exported in FBX format.

Then I go to Adobe Substance Painter for complete texturing part. After importing substance painter I need to bake this model. After baking I create a fill layer and placing our logo and others design. After that I finalized my textured. Then I exported texture and imported Autodesk Maya.

After complete our texturing part I assign a v-ray mtl in the model and importing texture in this mtl file. Finally I assigned the textured and create a lighting from v-ray. I take some plane light and adjust it our desire output. Finally I set my render settings and rendered it. Bellow my final output given.

Figure 4.1.24: Final model of the fresh wash

Here is my final output of the fresh wash project. Finally it's approved my team leader Hasan Mamun, Coo AAVA3D.

**4.1.8: TV REMORT:**

Here is another product modeling project. This is also client project. This project give me my team leader Hasan Mamun, Coo AAVA3D. First I take the all measurement this remort.



Figure 4.1.25: Reference of the TV Remort

First I take a box shape for creating this model. Then I increase my edges. Then I bevel two side for matching reference. Then I fixed top and bottom part. And bottom part I selected all bottom face and some minus scale.

And every border I take two supporting edges. Because this is a sub divisional modeling. Modeling has two part sub divisional modeling and poly modeling.

Then I create a curve button for this remort. So, I selected top curve part faces and circularized. After that I selected inside circularized face and some offset and offset face I create minus extrude.

All of buttons area I selected face and circularized it. Then I extrude up. And little button area I selected face without button area and minus extrude operation.

Finally I complete my TV remort model. Bellow I given the wireframe of TV remort.
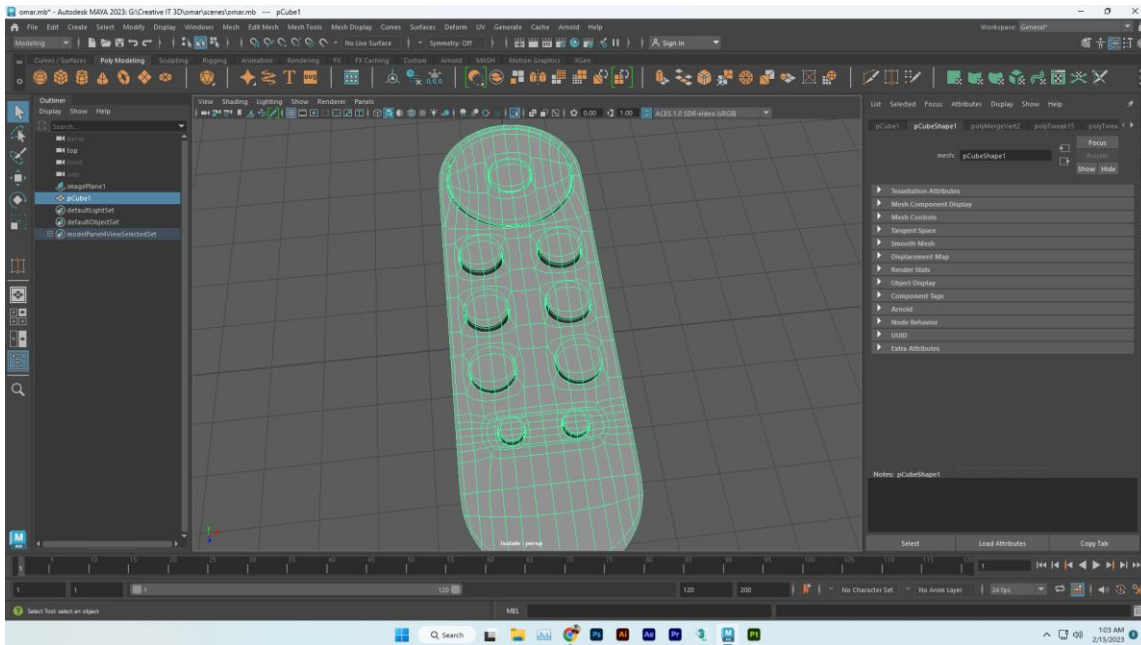
Figure 4.1.26: Wireframe of the TV remort

This is my model Wireframe of TV remort. Then I create a UV using Autodesk Maya auto UV.

Then I exported it in an FBX file. And sent to Adobe Substance Painter for texturing. We generated some alpha maps by using Adobe Photoshop to help in the texturing part. This Part I generated all of the button's logos.

Finally textured but I exported textured in three different colors.

I duplicated this model 3 times, and positioned side by side. Then I create a background with a plane. Now I create a new four mtl in v-ray. Three are using model textured assign and one background textured assign.

Finally set the Render setup and render it. My final output is given below.

Figure 4.1.27: Final Render of the TV Remort

This is my final output and I create it successfully. Then I sent this project file to my team leader he confirmed me all was okay. And fulfill our client satisfaction.

## 4.1.9: MOTOROLA RADIO:

This project is a teamwork project for a client. This reference image was sent me my team leader. My part was just modeling.



Figure 4.1.28: Reference of Motorola Radio.

This Motorola radio I created just model. In the first part of modeling I take a box shape. Then I resized as my reference provided. Then I selected font side two edges and bevel it. Then I created this radio screen part. That part I created by using Boolean operations. Then I fixed the operation edges by using Multicut tool. And another part I created this screen one copy of my Boolean object this positioning inside.

Under the bottom microphone part I take some edges this area then I selected vertex point and matching our reference images. After matchup I selected inside this area and minus extrude it. Then offset it and extrude up. Creating speaker whole part same procedure match up from vertex point moving. Then selected inside area and minus extrude it and face deleted.
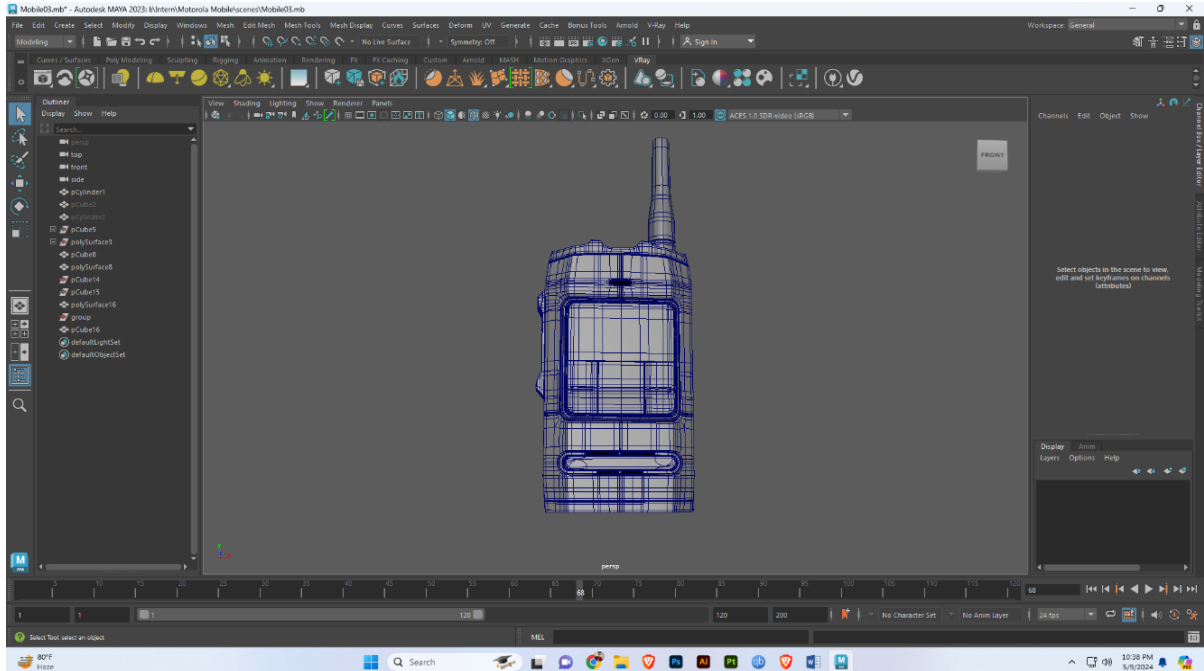
Figure 4.1.29: Wireframe of Motorola Radio.

In the top part of this radio I extrude up some area and bevel them for curving. And I created a button in this top part selected face and using circularized tool minus extrude and offset it and extrude up.

For creating the antenna part I used a cylinder. Then I selected edges and minus scale it and scale up.

After creating my base area I take some border edges for smooth my model. After toke border edges I selected smooth tool.

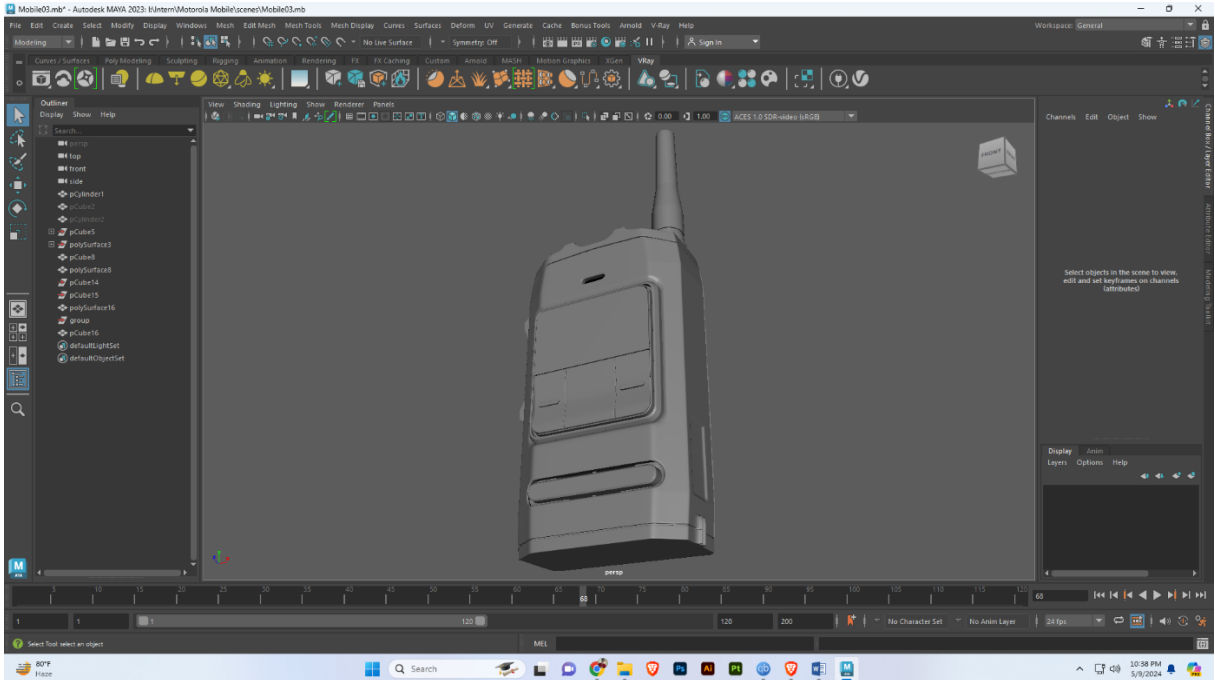After that my final result of creating Motorola Radio model given bellow.

Figure 4.1.30: Final Model of Motorola Radio.

Here is my model result. Finally I finished my part properly. Then I submit it my team leader Hasan Mamun, COO AAVA3D. And he approved this project.

**4.2 GAME ASSET MODELING:**

Game asset modeling is the process of creating the 3D shapes that make up the visual world of a video game. This includes everything from characters and weapons to vehicles, Props, buildings, and even the environment itself.

I had been created AAA game asset. AAA game assets are high-quality, visually stunning, and technically impressive assets used in video games. They can include characters, environments, props, weapons, vehicles, and more. AAA game assets are typically created by professional artists and designers who use specialized software to create realistic and detailed models and textures.

AAA game asset is very demanding for game industry. So, enjoy to creating AAA game asset.

**FOLLOWING PIPELINE:**



Figure 4.2.1: Following Pipeline

I follow this pipeline for creating my game AAA game asset. I create model in Autodesk Maya. Used high-poly for Z-brush. Adobe Substance Painter for texturing. And real-time rendered I used Marmoset Toolbag-4. And also post production work I used Adobe Photoshop.

**4.2.1: BANGLADESHI OLD OIL LAMP:**

In this project assign to me my supervisor or team leader Hasan Mamun, COO AAVA3D. He's sent me to make an old thing into a game asset. Then I selected Bangladeshi Old Oil Lamp. I toke a reference from online. Here is my reference images.



Figure 4.2.2: Reference of the Bangladeshi old oil lamp

After selected my game asset I created started. First I created oil lamp bottom part. First I take a cylinder to create this model. Then I adjust the cylinder my reference image and offset it and extrude up. First I created basically oil lamp block-out. After extrude I have another extrude and minus scale our top face selected.

And also upper part I created take a cylinder with minus extrude and plus extrude. Hole part I created it selected those area face and circularized it. Then I created minus extrude it and deleted that face.

In the above handle part I created it from using Ep curve tool. And take cylinder, cylinder and curve tool I selected and extrude it. That way I create upper handle.

And same procedure I follow to make side handle and also I converted it nurves to polygon modeling. And I take some edges and extrude some area that I can see from my reference images. Also I created a handle hole.

Then I created my main handle by using Ep curve tool then I extrude it same as my upper handle part.

Then I created oil lamp oil cap by using a cylinder shape. And also side part I extrude some faces for stripe my cap.

And glass part I toke a cylinder shape with proper subdivision. Then I selected some edges and minus scale to matching my reference glasses.
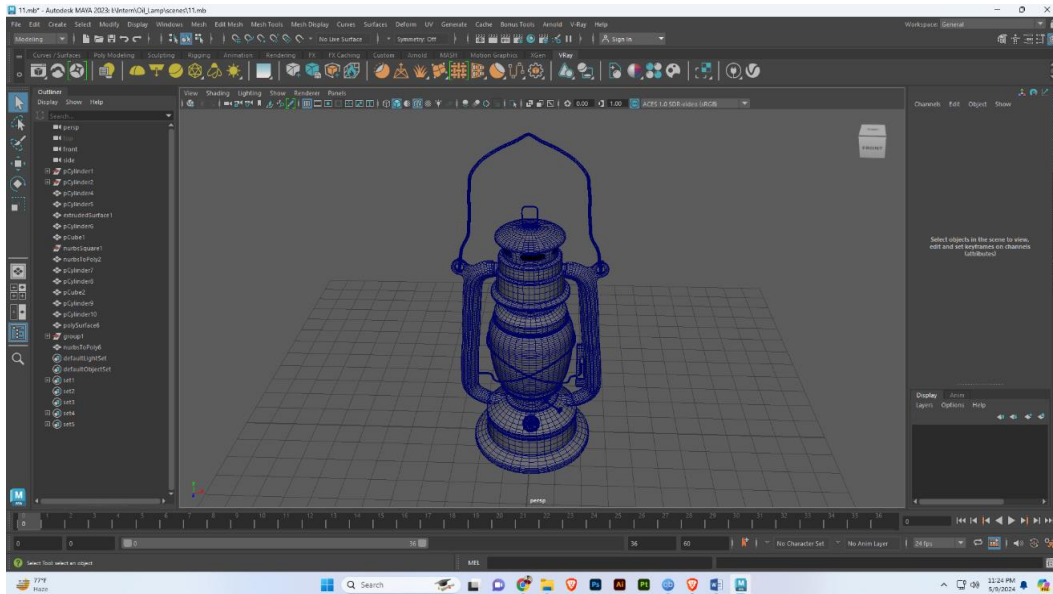


Figure 4.2.3: Wireframe of the Bangladeshi old oil lamp

This is my oil lamp wireframe view. That way I can make old oil lamp model. Then UV this model from rizom UV.

Then I sent this model Adobe Substance Painter for texturing part. I create a texture by a substance material using, and also I used some rust texture for make it old oil lamp. After

texturing I exported texture and I sent this model marmoset toolbag-4 for lighting and rendering.

After lighting I setup my render settings and rendered it. Here is my final output of old oil lamp. I created post-production worked in Photoshop.



Figure 4.2.4: Final Render of the Bangladeshi old oil lamp

## 4.2.1: Bangladeshi Military Radio:

This project assign to me my Intern supervisor Hasan Mamun. For improving our skill more. They said to me create a Bangladeshi Military Radio. Then I collected lot of images to create this Military radio. Finally I created a reference images combine a lot of images.



Figure 4.2.5: Reference of Bangladeshi Military Radio

This is my reference images by creating a Bangladeshi Military Radio game asset.

First I create a block-out of Bangladeshi military radio project. I take a screen shoot for this block out and attached it.
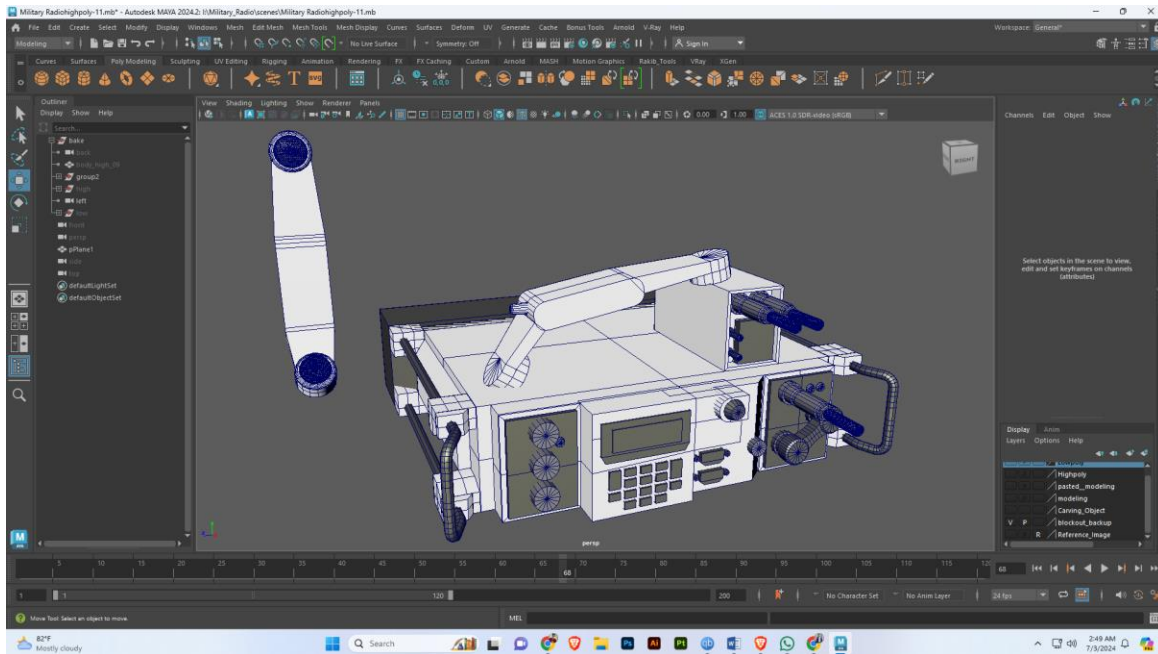


Figure 4.2.6: Block-out of Bangladeshi Military Radio

This block-out help for future updated this model. I created this block out every part to create a new shape. There I used box, cylinder, helix etc. I create it a shape to a part. And I am also using a curve tool to make this radio handle. And all of file combined together. And when I working those part I selected those area and separated it.

This way to I improved this project. In this project I make a low poly file and a high poly file. Low poly making in Maya, High poly making in Z-brush. So first I create my modeling part to create a high poly object of Bangladeshi Military Radio.

After completing my modeling part I have no use any Boolean operation in Autodesk Maya. I created of object Boolean in Z-brush its very nice result. I used some plugin for Maya to Z-brush Bridge. Also some plugin used in z-brush that can help faster our work. Here I sent my z-brush screen shoot.
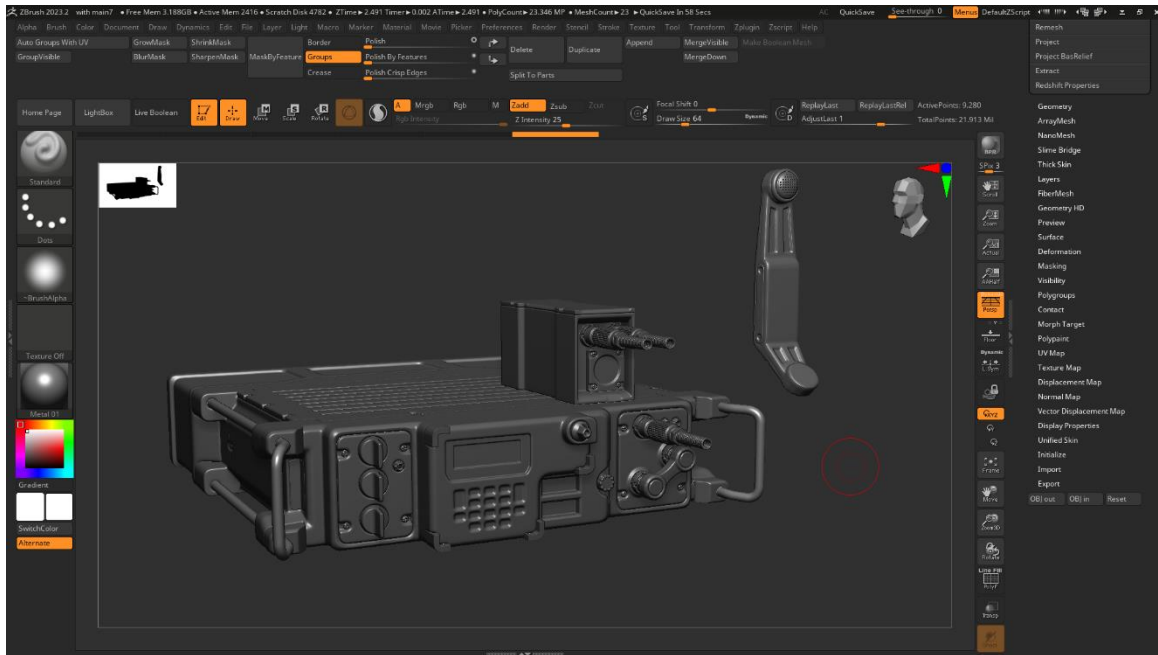
Figure 4.2.7: High poly of Bangladeshi Military Radio

This is I created in z-brush sent to Maya model file. First, when I made my model, I cut UV the hard edges. Then I do Auto UV with Z-Brush then if there is any Boolean operation I do it otherwise I increase the mesh with Dyna-mesh master plugin used.

Then I click the Mask by feature option to select the hard edges masking. Then I increased our masking area for hitting the button grow mask and sharpen mask and lastly blur mask. Then I click my masking area polish and hit polish button. My hard edge area nicely smooth. Thus I import all the parts of model from Maya. But that required Booleans are Boolean first.

After completing my all of parts polishing and Boolean I exported it and back to Maya for creating my low poly object.

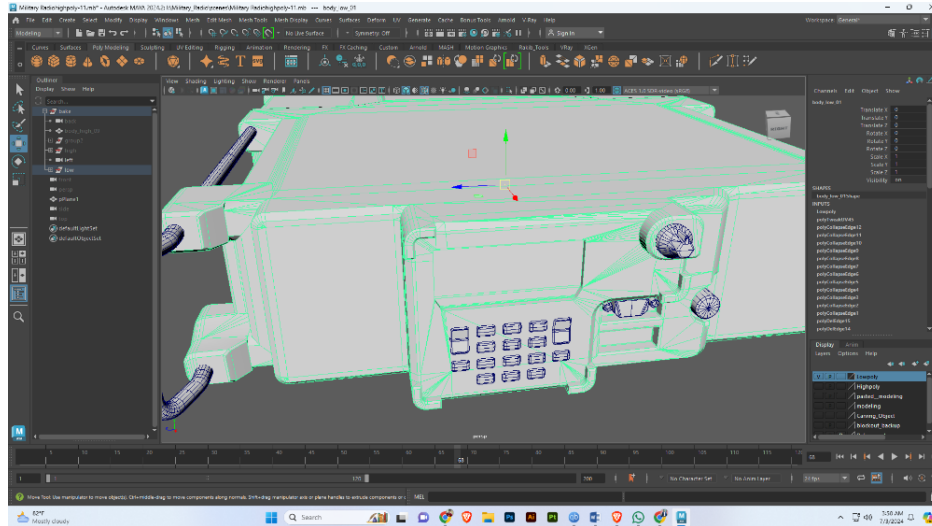I attached my low poly file and describes it bellow.

Figure 4.2.8: Low poly of Bangladeshi Military Radio

I created this part in Autodesk Maya. This part make only 18000+ polygon. In this part I make lower polygon that poly don't needed I deleted and Look at the high poly model and see this model.
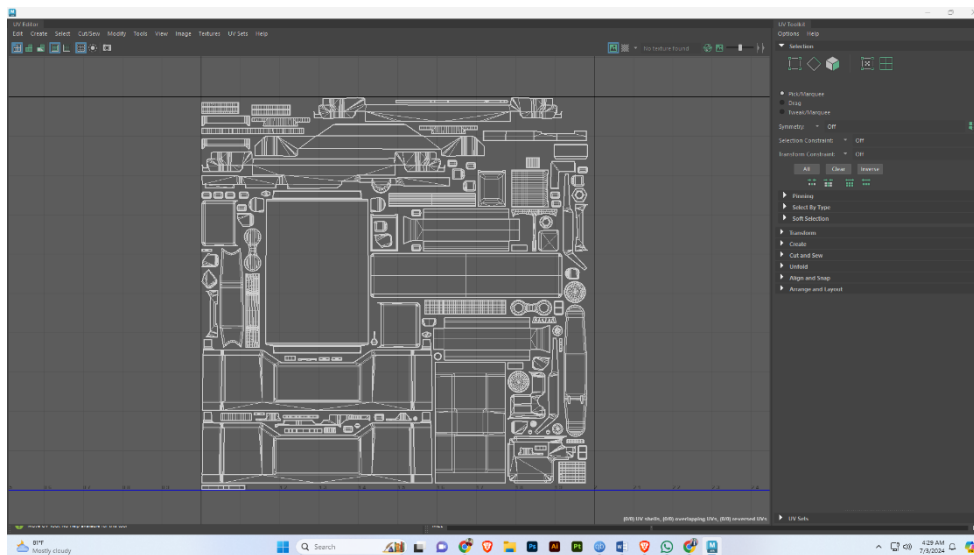


Figure 4.2.9: UV in Maya of Bangladeshi Military Radio

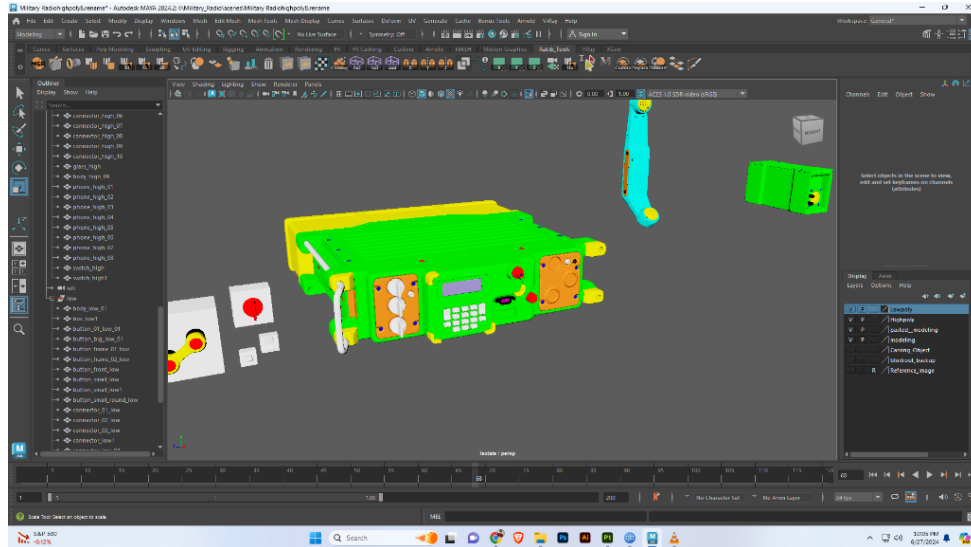In this part I UV my project all of parts.

Figure 4.2.10: Color id map of Bangladeshi Military Radio

This part of this project I make a color id map for helping my texturing. I make color id in high poly. Because this high poly project baked as my low poly file.
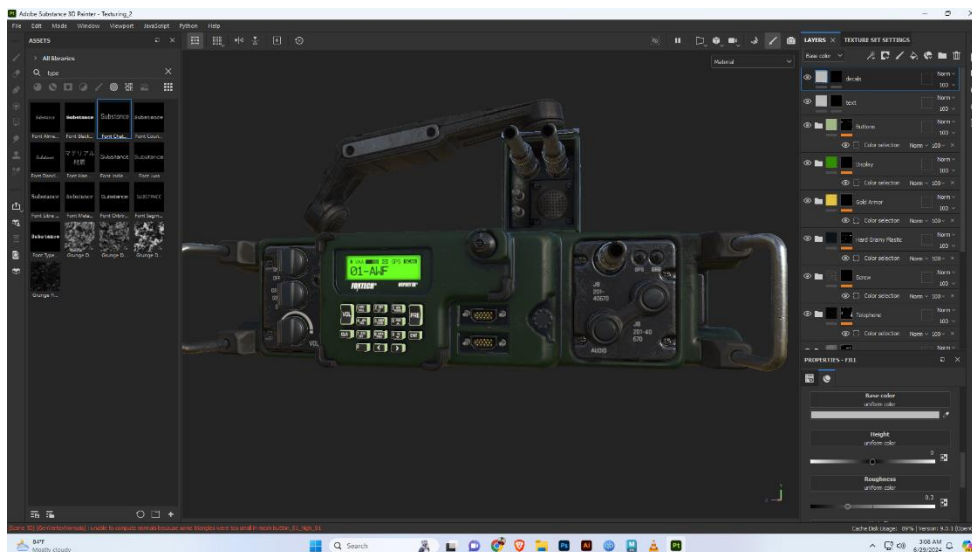


Figure 4.2.11: Texture in Substance of Bangladeshi Military Radio

In this part I textured my project all of parts. I texture layer by layer of this project.
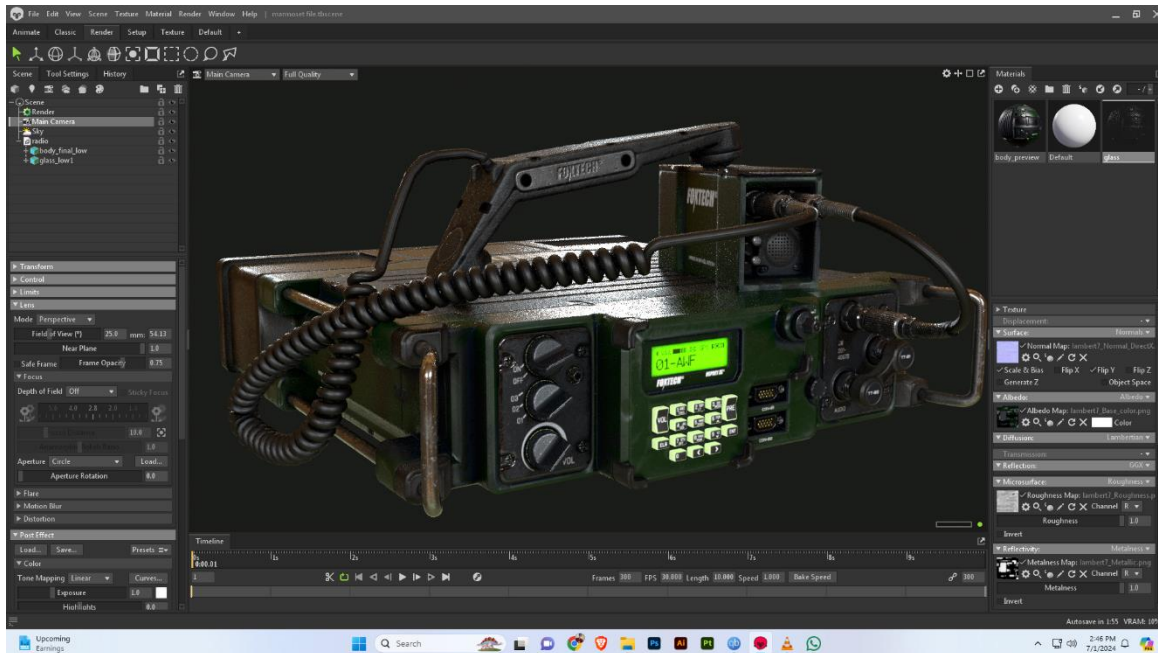
Figure 4.2.12: Lighting and rendering marmoset of Bangladeshi Military Radio

In this part I imported texture and assign my model and also I make a lighting in this project. After lighting setup I toke a camera and I setup render settings. After render set the render settings. Finally I rendered it.

After rendering this project I used Photoshop for this project post-production work. Final output I given bellow.

Figure 4.2.13: Final Render of Bangladeshi Military Radio



Figure 4.2.14: Final Render of Bangladeshi Military Radio

# CHAPTER 5

## CHALLENGES

Throughout my internship, I encountered various challenges, including complex geometric shapes, intricate surface details, and integrating cultural authenticity into my designs. For instance, modeling the Bangladeshi old oil lamp required meticulous attention to historical references and material textures to accurately portray its aged appearance. Each challenge was an opportunity to innovate and refine my modeling techniques, often seeking guidance from mentors and leveraging online resources to overcome technical hurdles.

Render time is a significant consideration in creating computer graphics, and the absence of a dedicated graphics card posed difficulties in texturing, lighting, and rendering in Marmoset Toolbag-4. Programs like Substance Painter and Marmoset Toolbag-4 primarily utilize a GPU for smooth functioning, making dedicated graphics processing power essential for handling complex textures and real-time rendering.

Working on the Bangladeshi Military Radio project, I faced numerous problems, including crashes in Maya and Z-Brush files, which forced me to restart from scratch. High-poly models needed to be optimized for efficient use in a game engine, involving reducing the polygon count while maintaining visual quality. Tools like re-topology and baking techniques were explored to achieve this.

Despite the poor resources available for creating game assets, I successfully completed my projects by overcoming challenges with the help of online resources and my internship supervisor. Creating complex shapes and maintaining high-quality models required persistence and innovative problem-solving.

# CHAPTER 6

## CONCLUSION

In today's world, almost every platform includes a 3D editor as a basic function, offering endless variations for realizing any project. This capability is crucial for game art, game asset creation, and product modeling, enabling businesses to present their initiatives to customers in the most favorable light.

During this study, we explored various 3D modeling methods and techniques. We reviewed three main software packages for three-dimensional modeling and selected the most suitable ones for our project. This allowed us to expand our knowledge of new software while deepening our expertise with familiar tools. The workflow, modeling techniques, and UV unwrapping texturing described in the Challenge paper were instrumental in this process, and we learned a completely new UV method, enhancing the precision and accuracy of our models.

Our efforts resulted in highly accurate and well-shaped models, promising a better return on investment for our clients. The concept of 3D product modeling for advertising is relatively new in our country, and our project sets a high standard for future developments in this field.

Despite the short timeframe, we completed the project to the highest standards, making collaboration enjoyable and successful. The AAVA 3D Institute expressed great satisfaction with our work.

I am Md. Rakib Hossain, a student of Multimedia and Creative Technology at Daffodil International University. This report, titled "Exploring 3D Product Modeling and Game Asset Development through AAVA3D Internship," reflects my journey and accomplishments in this project.

# CHAPTER 7

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