EXPLORING 3D MODELING & VISUALIZATION THROUGH DYNAMICFLOW INTERNSHIP

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This Report Presented in Partial Fulfillment of the Requirements for the Degree of Bachelor of Science in Computer Science and Engineering

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DAFFODIL INTERNATIONAL UNIVERSITY

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APPROVAL

This Project titled "**3D MODELER AND VISUALIZER**", submitted by **Emon Chandra Das**, ID:201-40-688 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 & Creative Technology and approved as to its style and contents. The presentation has been held on 11 January, 2025

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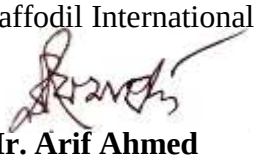

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DECLARATION

We hereby declare that, this project has been done by us under the supervision of **Mizanur Rahman, Assistant professor, Department of MCT** Daffodil International University. We 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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I am profoundly grateful to Mr. Md Salauddin, Assistant Professor and Head of the Department of Multimedia and Creative Technology at Daffodil International University in Savar, Birulia, Dhaka, Bangladesh. Our extensive knowledge and interest in the subject of "3D Modeling & Visualization" are essential for the successful completion of this project. This effort was made possible by his unwavering patience, scholarly direction, constant encouragement, frequent and energetic supervision, constructive criticism, helpful counsel, and reading and correcting numerous inferior drafts at all stages.

I would like to thank Mr. Mizanur Rahman, Assistant Professor in the Department of Multimedia and Creative Technology at Daffodil International University, for his collaborative supervision. Without his guidance, this initiative would not have come to fruition.

I am grateful to all who participated in the survey and interview for my internship project, including my batch mates, teachers (Mr. Apurba Ghosh, Mr. Dr. Md. Samaun Hasan, Mr. Kazi Jahid Hasan, Mr. Arif Ahmed), and supervisor (Head of Department of Multimedia and Creative Technology) for their assistance in completing the internship project.

I must respectfully recognize our parents' ongoing support and patience.

ABSTRACT

Multimedia encompasses a wide array of mediums such as text, audio, graphics, animation, video, and interactive elements, designed to inform or entertain audiences. Throughout history, humans have sought intellectual connections, employing diverse communication methods from early computer usage to the ancient practice of cave wall paintings. Along this journey, multimedia visualization has been a compelling tool, enhancing human interaction with their environment.

Today, the 3d modeling graphics and video editing plays a pivotal role in communication, constantly evolving. My project was executed using 3D Max, Blender, Substance Painter, Adobe Photoshop, and Adobe Illustrator. It's essential to identify the target audience before crafting and delivering impactful messages and visuals that inspire action. My primary focus revolved around creating 3D models and animations, utilizing graphic materials and plugins to achieve realism. For still image content, I utilized a suite of tools including 3D Max, Blender, Adobe Illustrator, Photoshop, stock images, and various other software.

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CHAPTER 1
Introduction of my Internship

1.1 What is an internship?

An internship is a temporary work situation within an organization or corporation and usually is offered to students or recent graduates. It enables a person to have practical hands-on experience within an industry or a subject relevant to their studies or professional goals.

An internship is an opportunity that bridges the gap between academics and employment. During this period, interns get to experience working on actual projects, activities, or assignments that are included in their course of study. It helps an individual find out how a particular company conducts its day-to-day business.

Skill Building and Learning: Interns gain new skills related to their sector, whether it be technical, people-oriented, or industry-specific-from things like software proficiency to communication and collaborative ability.

It opens the door to networking with practitioners in the area. Building relationships will lead to ease in professional opportunities and career advancement later on.

Career Exploration: Internships allow one to get into almost every position and industry. Real experience would thus enable the students to determine whether the field of study/choice is among those suitable for career fulfillment.

1.2 Why are internships important?

These are important for many reasons.

Practical Exposure: They present the students with actual working conditions where they are able to apply what they have been taught theoretically in the classrooms.

The internships provide opportunities to learn and fine-tune specialized skills relevant to a particular industry or job. Thus, they make them more employable.

They learn about the dynamics, procedures, and culture followed within the industry, which would help the students make better career choices.

Networking: The internships expose you to professionals, mentors, and peers. This may come in handy when future opportunities in careers or mentorship arise. Building on your CV: Working exposure through internships builds a CV by showing practical exposure and commitment to the profession. Testing and Clarification: They provide opportunities for individuals to test several options and discover their interests and preferences in the area of study.

Full-time Job Opportunities: Many a time, interns with skill and devotion get full-time opportunities after their internships. Last but not least, internships connect the gap between studies and job implementation for a student.

1.3 Name of the Organization

"DYNAMICFLOW" is the name of the organization I work for throughout my internship.

The name of the organization is "DYNAMICFLOW" I work for throughout my internship.

1.4 Introduction of the Organization

DYNAMICFLOW" is more than a training center for 3D animation; it's a mentorship and career guidance center. With the helm headed by Nahidur Abedin, a highly experienced instructor for over twenty years, "DYNAMICFLOW" pioneered teaching 3D animation in Bangladesh and takes care of every possible budding talent involved in creativity.

It's not just about education; it's about carving careers. DYNAMICFLOW therefore focuses on mentorship and counseling with a view to launching people into careers in multimedia. Even more important, its vision lies in contributing towards Bangladesh's development by creating high-quality professionals to face this fast-moving industry.

The quality represents one of the cornerstones to offering premium products, services, and training at affordable rates by keeping in mind customer satisfaction. DYNAMICFLOW will pursue a growth path in its bid to gradually turn itself into a technology-based solution hub by commanding the leading position in the specialized niche. Their mission is not education alone but empowerment, with a determination to leave an enduring impression in the realm of multimedia.

1.5 Describe my internship in detail

It is easily noticeable that my enthusiasm for the modeling of 3D game elements has been reflected in attempts to get an internship that matches my career goals. DYNAMICFLOW, trusting my capabilities, gave me a great chance to get closer to this field and thus gave room for my professional growth.

The biggest project entrusted to me during this internship included working on a pdf file that contained designs of game elements and details of a bookshelf. It gave me hands-on experience with texturing and animation, important parts of the 3D game development process, and helped me to understand the broader role of a 3D game element developer.

My internship, therefore, had a personalized and comprehensive structure under the direct mentorship of the DYNAMICFLOW CEO. In addition to regular updates, which came twice a week, where I would present the progress of my work, the weekly scrutiny and guidance from the CEO proved to be invaluable touchpoints. This kind of personalized mentorship provided not just the essential feedback but also insight into industry standards and expectations.

1.6 Duration of my internship

June to December 2024 is the time frame for my internship.

CHAPTER 2
Background Study

Extensive research and analysis were essential in our road to excellence for the perfection of the design and animation of 3D game elements. Our approach not only meant deep study of the basics of the market but also customers' likings and preferences. Application of 3D modeling skills turned out to be our cornerstone, which facilitated our ability to address the market's demands and enhance the quality of our offerings. Customer-centricity lay at the heart of our decisions, as these influenced product design, style, and functionality. Immersion in architecture studios and insight into common processes of product modeling increased our knowledge. Reel shows allowed us to increase our knowledge and appreciate key industry developments and consumer needs through meetings with senior designers. The close preparation included the creation of a detailed checklist describing our aims: shifting from product to furniture modeling and, finally, to interior and outdoor architectural visualization. The immense store of online information from Dynamicflow was truly instrumental in guiding our workflow. These resources covered key issues that ranged from color perception, camera angles, and illumination techniques to intermediate polygonal modeling, thereby hugely contributing to the success and general quality of the work.

CHAPTER 3

Details of Software

3.1 3DS MAX:

Autodesk 3ds Max is strong and famous for its multifunctional use in 3D modeling, animation, simulation, and rendering. It has gained widespread acceptance in industries and is considered a basic utility tool in many branches of gaming, architecture, film, and television.

Key Features:

Modeling Tools: Variations include options for polygonal, spline-based, and NURBS-based modeling.

Animation: Advanced animation options, key frame animation, rigging, and constraints.

Rendering: Several rendering engines are supported; this gives realistic results for a huge range of options regarding lighting and materials. Simulation: It can perform physics-based dynamics, particles, fluid effects, and more simulations. Scripting: The user has the option to write a custom script or create plugins using Adscript or Python. Workflow Modeling: Polygonal, Spline-based, and parametric methodologies. Texturing and Materials: Node-based material editor used for texture and material applications. Animation offers a lot of animation functionality, from constructing intricate animations and rigs to motion paths.

The rendering settings determine the lighting, special effects, and rendering of high-quality images or animations.

Industry Uses:

Gaming covers asset creation, character modeling, and environmental design.

Architecture and Visualization: It is used to create realistic scenes for architectural visualization.

Film and Animation: It encompasses visual effects, character animation, and the construction of an environment.

Compatibility:

File Formats: A wide range of supported formats strengthens its interoperability with other software.

Updates and Learning Resources:

Regular updates are released by Autodesk with new features and enhancements. Learning resources include a number of online tutorials, manuals, and forums for learning and debugging.

Figure 3.1: 3D MAX

3.2 Blender

Blender is a free, open-source 3D creation package that can be used for a multitude of purposes 3D designing, animation, simulation, and rendering. Please find below the details about your report.

Blender: Introduction Blender is a powerful open source software tool independent from many package licensing mechanisms and is used for 3D modeling, animation, visual effects, and more. Blenders are quite functional for professionals and amateurs alike, considering their multitude of uses and ease of manipulation.

Key Features: Modeling Tools: A complete set of tools for polygonal, sculptural, and parametric modeling. Animation: Good rendering with great skill in rigging, keyframe animation, and motion tracking. Rendering: Inbuilt rendering engine, EEVEE and Cycles generates high output

renderings. Simulation tools, physics-based simulations include fluid dynamics and smoke and particle systems.

Compositing and Video Editing: The app includes video editing and composing features.

Workflow: Use a variety of modelling tools to create 3D models in several ways. Texturing and Materials: Materials are to be created and UV mapping for taking textures on objects. Animation: Rigging, Keyframe animation, and timeline-based animation utilities. Advanced rendering settings enable real-time rendering and quality output. Industry Applications Gaming: Asset creation, level designing, and character animation. Film and Animation: Visual effects, character animation, and building of scenes. Architectural Visualization: It is the rendering of architectural models and scenes. Compatibility File Formats: Has a wide range of file formats that can be used to ensure compatibility with other programs.

Figure 3.2: Blender

3.3 Adobe Substance 3d Painter

Adobe Substance 3D Painter is a fully featured texturing tool with a versatile and efficient workflow that allows for the creation of high-fidelity textures and materials for 3D assets. It becomes the pivot point in a production pipeline for game development and visual effects when creating 3D content.

Key Features:

Material Creation: Intuitive tools for creating various types of materials and textures-from realistic surfaces and weathering effects to procedural textures.

Smart Materials: A library of pre-built materials and smart masks for the swift creation of textures in an efficient manner. Substance Engine: Powered by the Substance Engine to instantaneously provide feedback and allow procedural workflows. Layer-Based Workflow: Non-destructive layer-based workflow that easily empowers the user to change and manipulate their textures with ease. PBR Support: Integrates the PBR workflow for an accurate and realistic material representation. Workflow Import and UV Mapping: Ability to import 3D models and perform UV mapping in order to prepare surfaces for texturing.

Material Creation: Utilize a variety of brushes, smart materials, and procedural textures in creating complex and realistic materials.

Texture Painting: Paint directly onto 3D models in real time and leverage layer-based techniques for fast corrections.

Export and Integration: Export textures and maps to use in 3D software, game engines, or rendering packages.

Industry Applications:

Gaming: Asset texturing, character design, environment creation, and texture detailing.

Film and Animation: Texturing for visual effects, character models, and scene detailing.

Product Design: Texturing, material creation for product visualization and prototyping. Compatibility Integration: It smoothly integrates into nearly all 3D software and game engines. Formats: Offers broad options in terms of file formats to import and export textures as well as models.

Figure 3.3: Adobe Substance 3d Painter

3.4 Adobe Photoshop

Adobe Photoshop is the highly used software in image editing and design, featuring a wide range of capabilities and versatility. The tool finds its useful application in a variety of professions: graphic design, photography, web design, and digital artwork.

Key Features:

Image Editing: photo editing, editing, and changing images visual design-creation of images, logos, posters, and other visual material.

Digital Art: Paint, draw and produce digital art by using the vast variety of different brushes and effects available. Layer-Based Editing: Non-Destructive editing provides layer-based workflows that result in seamless edits. MASKING AND SELECTION TOOLS: Precise selection and masking tools facilitate complex editing and compositing. Filters and Effects: Huge collection of filters, effects, and tweaks for creative additions.

Workflow:

Importing and Preparation: The images are to be imported and prepared for editing through cropping, resizing, and color adjustments.

Image Manipulation: Editing involves the use of a variety of tools to accomplish tasks such as retouching, color correction, and manipulation.

Graphic Design: Design graphics, illustrations, and designs with the aid of vector-based drawing tools, in addition to the text engine.

Digital Art: Creation of digital artworks and compositions by means of painting and drawing tools.

Exports and Integration: Different export options are web, print, or further working in other software.

Figure 3.4: Adobe Photoshop

3.5 Adobe Premiere Pro

Adobe Premiere Pro is currently one of the most state-of-the-art programs to edit video with, extending the line of advanced tools and features professionals can use in the preparation of a video. Being highly versatile and integrated into the Adobe Creative Cloud suite, Premiere Pro has earned its place among landmarks for film, television, and even web video editing.

Core Features:

Timeline-Based Editing: nonlinear editing in a timeline interface allows seamless arrangement and manipulation of video and audio tracks.

Editing Tools: Advanced editing toolset to trim, cut, and arrange the footage appropriately.

Effects and Transitions: A great library of effects, transitions, and filters for creatively enhancing footage.

Color Correction: Advanced color grading and correction tools to achieve perfect visual appeal.

Audio Editing: A variety of different audio manipulations, mixing, and enhancing to assure the best quality.

Multi-platform Integration: Seamless collaboration between this and other Adobe Creative Cloud applications for a neat workflow.

Workflow:

Import and Organization: Import media and organize it into bins for efficient editing. Editing: Editing of video fragments on the timeline, including cut, trim, and sequence. Effects and Color Grading: Adding effects, transitions, and color correction to achieve a particular look or feel. Audio Editing: Cleaning up noisy audio, adding sound effects, and mixing audio tracks. Export and Integration: Exports of final video projects in various formats for different platforms. Industry Applications

Film and Television: Professional video editing, post-production, and color grading.

Online Content Creation: Creating YouTube videos, content for social media platforms, and producing web series.

Advertising and Marketing: Production of commercial videos and promotional content.

Compatibility

File Formats: It supports a great number of video and audio file formats for import and export.

Figure 3.5: Adobe Premiere Pro

CHAPTER 4

Project Workflow

3D Modeling

This would involve the manipulation of polygons, edges, and vertices in a virtual 3D environment; this practice is what is commonly known as 3D modeling, one of the crucial steps in making spectacular images stand out in movies, animations, and video games. Great characteristics and structures would often be showcased in various media, which are a result of such. Specialist software from professional 3D production could do this either by manually sculpting polygonal surfaces or through real scanning techniques of the real world. A methodological approach is possible since the application may be made to a wide range of areas from engineering and architecture, up to design.

Blender is a well-known, multi-use tool that would be utilized for this project. It begins with basic primitives such as boxes and lines laying the base for further investigation. Several methods are modified to make the models more diverse. A range of tools has been put to use in order to create forms and structures comprising line, push/pull, offset, follow me, arc, bend, and grid. This design process maintains one important feature: the nourishment of square polygons to ensure precision and consistency throughout all models developed.

4.1 Watch

In this project assign to me my supervisor or team leader Nahidur Abedin, He's sent me to make a hummer into a game asset. I took a reference from online. Here are my reference images.

Figure 4.1.1: Reference of Watch

I started by breaking down the design into key components: the watch face, the body, the strap, and the crown and buttons. Each part was carefully modeled for accuracy and attention to detail.

I started with the watch face, which is a simple cylindrical shape. The base was a cylinder, which I scaled to size and thickness. Then, I wanted to define the outer frame by creating an inset on the top face, leaving a ring around the edge to represent the bezel. That gave me a clear definition of where the screen area was and where the frame was.

For the watch body, I extended the sides of the cylinder to give it depth to form the casing that will house the internal mechanisms of the watch. I added the Bevel Modifier to round the edges, so it would look smooth and polished. To create holes for attaching the strap, I used the Boolean Modifier with a smaller cylinder to cut out precise openings on opposite sides of the body.

First, I started with some elongated rectangles for the strap. Adding edge loops down its length allowed me to slightly bend the shapes in order to mimic the natural curve of a watch strap. More details came in the form of stitching lines or strap holes, added with the Knife Tool. I did the buckle separately by extruding smaller shapes into loops and prongs.

Next, I modeled the crown and buttons. The crown was made with a cylinder, scaled down to a small size, and detailed with grooves using the Edge Loop Tool. The buttons were created by extruding small circular shapes and aligning them with the watch body.

After having put all the pieces together, I used the Subdivision Surface Modifier to smooth the overall design. Later, I aligned and adjusted the proportions accordingly to get a clean, accurate model of a watch that embodies the essence of a traditional timepiece.

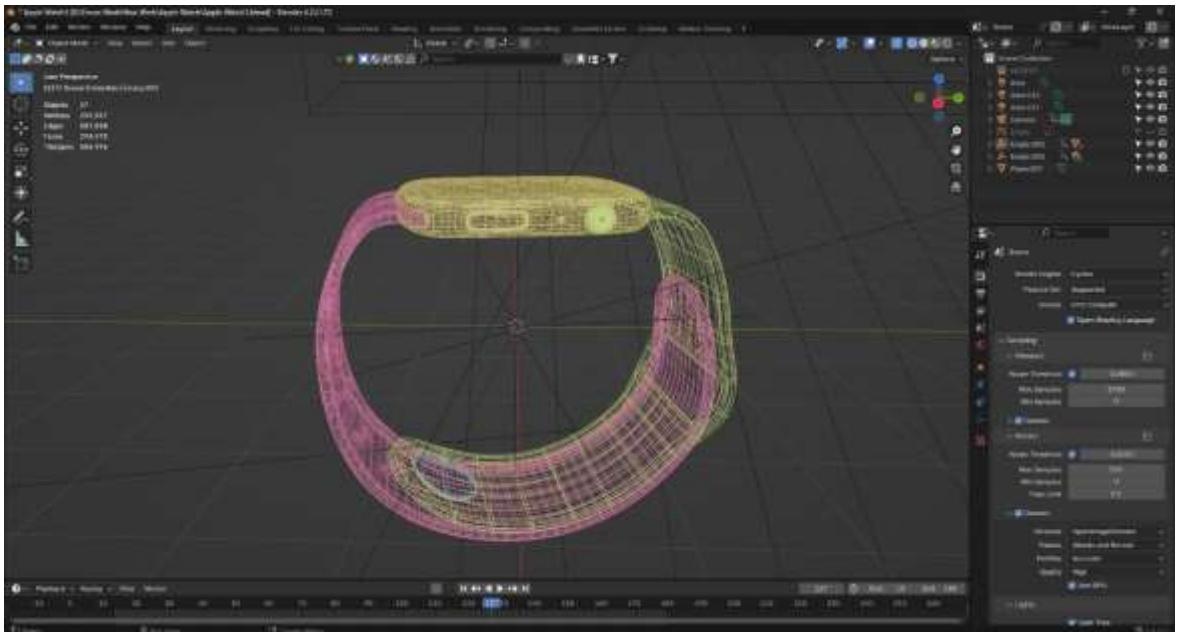

Figure 4.1.2: Wireframe of Watch

I focused on the creation of realistic materials for each component: face, body, strap, and crown. Using the Shader Editor, I worked with Principled BSDF shaders to give materials appropriate properties to their respective surfaces.

So, the starting point of course is going to be the face. First, with the display using a dark slightly reflecting material with Transmission and Roughness values opened just enough to give this

natural reflection that seems to carry no shine in its surface, for the bezel trying with a metal shader, playing with the Metallic and Roughness slider to pop in a shining, softish metal reflection.

The body of the watch was given a brushed metal texture. I used a combination of procedural noise textures and color ramps to create fine horizontal lines, simulating the grain of brushed metal. This added a sense of depth and realism without requiring image-based textures.

For the strap, I chose a matte material to represent leather or silicone, depending on the style of the watch. Incorporating a noise texture with slight bump mapping simulated the slight imperfections on the surface of the material. For leather straps, I added a procedural grunge texture to simulate wear and enhance realism.

The crown and buttons were textured with metallic shaders, similar to the bezel, but with slightly higher roughness to differentiate their finish. To highlight grooves on the crown, I used a bump map, adding fine details that caught the light.

With all the materials on, I worked on adjusting the lighting with an HDRI environment in order to test how the textures would interact with light. This process made sure that the various parts of the watch reflected and detracted light realistically, making it cohesive and polished as a model.

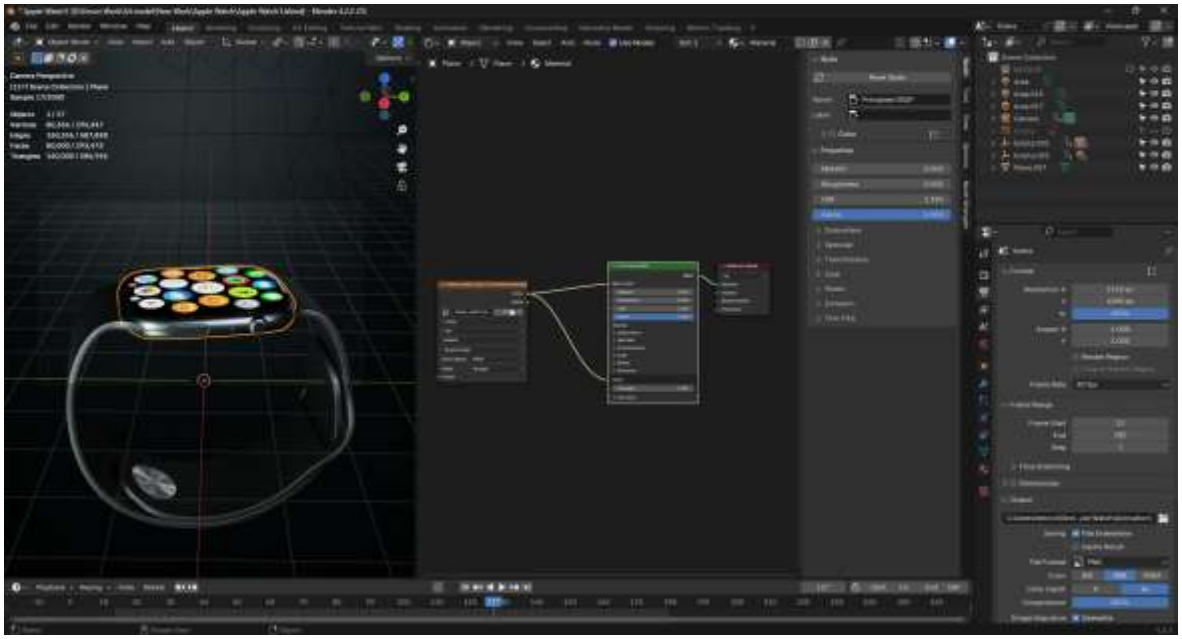

Figure 4.1.3: Texture of Watch

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

Shot 1

Figure 4.1.4: Final Watch (1)

Shot 2

Figure 4.1.5: Final Watch (2)

4.2 iPhone

My supervisor or team leader Nahidur Abedin, He's sent me to make a Traffic Item into a game asset. I took a reference from online. Here is my reference images

Figure 4.2.1: Reference of Final Watch

I have tried to model its clean and minimalist design, breaking it down into key components: the body, screen, buttons, and camera module.

I started off with the body of the iPhone, starting with a cube. I scaled that into proportions and applied the Bevel Modifier to the edges, rounding them off to mimic the sleek curves of this device. This was an important step in the creation process, as it achieved that smooth, polished look that really defines the design of the iPhone.

Then, I modeled the screen by selecting the top face of the body and using the Inset Faces tool to create a recessed area; this would represent the bezel around the screen. This inset face was then extruded very slightly inwards to give it depth and thus appear different from the body visually.

For the buttons, I used cylinders for the volume buttons and the power button. These were scaled and positioned accurately along the sides of the phone. I extruded and beveled the buttons slightly to give them a realistic, tactile appearance. The silent mode switch was created by scaling down a cube and embedding it partially into the side of the phone.

The camera module was modeled on the back. I modeled the lenses with multiple cylinders extruding them slightly to give depth. I created a camera bump by creating a raised rectangular area by using Inset Faces and Extrude tools. Place the lenses within this area, moving them so that they are centered.

Last but not least, the minor details were added: speaker grills, charging port, and antenna lines. Some combinations of using Boolean operations and edge loops helped to get the correct shapes into the body. When all components were assembled, the Subdivision Surface Modifier was used to get a smooth finish in order for the iPhone model to capture its iconic seamless design.

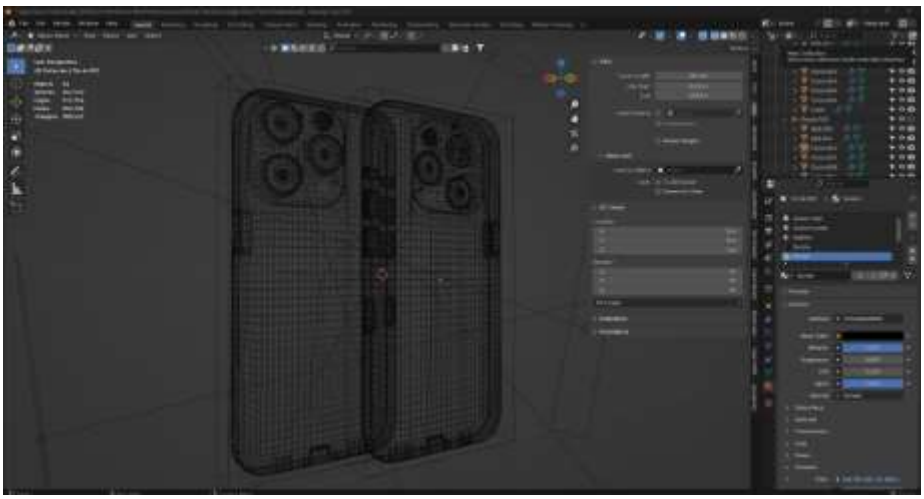

Figure 4.2.2: Wireframe of iPhone

I will be texturing this iPhone in Blender using realistic materials and finishes for the body, screen, buttons, and camera module. I'm going to be working with the Principled BSDF shaders with procedural textures within the Shader Editor to replicate that modern aesthetic of this iPhone.

For the body, I applied a metallic shader to simulate an aluminum or stainless-steel frame. The Metallic slider was set to 1, while playing with the value of Roughness gave me the right amount

of gloss and light reflection. Subtle imperfections were added with a Noise Texture connected to the roughness input, making the material more natural and realistic.

The screen was given a texture to simulate smooth glass. I then used a dark, reflective material with high Transmission for transparency and adjusted the IOR to get realistic light refraction. I then used a very gentle gradient with a Color Ramp simulating the reflection of light across the display. Added to that was an HDRI environment map that would give a pretty accurate reflection on the surface of the glass.

For the buttons, I created a brushed metal texture with a Noise Texture combined with a Color Ramp, creating fine lines that simulate the grain of brushed metal. Set the Metallic value to 1, and increase Roughness slightly to differentiate buttons from the polished frame.

For the camera module, I needed different textures for the lenses and the surrounding bump. I applied to the lenses a reflective, dark material with low roughness to simulate polished glass. The camera bump was textured in a matte finish to contrast with the glossy lenses, using a simple color with little reflection.

The Apple logo and text on the back were done last with the use of UV mapping and an image texture, carefully aligned for better accuracy. Thus, I got a realistically textured iPhone, having materials quite right for its modern and refined design.

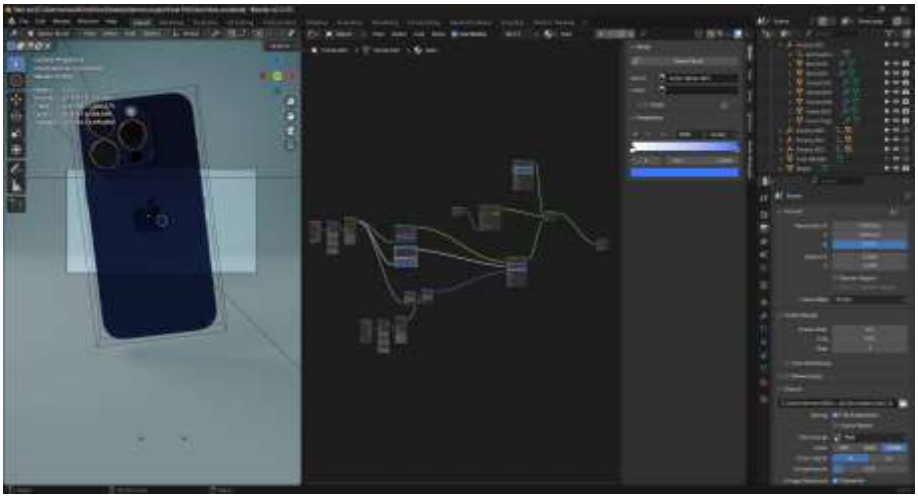

Figure 4.2.3: Texture of iPhone

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

Shot 1

Figure 4.2.4: Final iPhone (1)

Shot 2

Figure 4.2.5: Final iPhone

4.3 Soda Can

In this project assign to me my supervisor or team leader Nahidur Abedin, He's sent me to make a hummer into a game asset. I took a reference from online. Here are my reference images.

Figure 4.3.1: Reference of Soda Can

I was concerned with modeling the main components: the cylindrical body, the top and bottom caps, and the pull tab. First of all, I modeled the main body of the can. For the base shape, I used a cylinder, scaling it down proportionally to a typical soda can. To make it smooth, I applied the Subdivision Surface Modifier, which gave the cylinder a more refined, rounded appearance.

I then molded the top and bottom caps for the can: For the top cap, I considered a smaller-sized cylinder and achieved its scale inside the top opening of the body. Then I did some extrusion in the top face a little while inward to build the depth of this cap. I added detail to this by creating an inset at the center with the Inset Faces tool, and hence this looked like the rim of the cap. The bottom cap was similar but I added a slight extrusion in order to give it a more accurate view.

The cylinder served as the base of the pull tab, while I used an elliptical shape that is smaller in size and drawn out for making the loop part of the tab. I extruded these components and shaped it into what the design looks like by nature. I then aligned it to the top cap and positioned it to sit just above the can's surface.

I added small details: subtle edge loops around the top and bottom of the can, which helped sharpen the edges and make clean transitions between components. I further adjusted the proportions, making sure all the parts aligned so that the soda can would look realistic and structurally sound. This was the clean, accurate 3D model of a soda can, ready for further detailing or texturing.

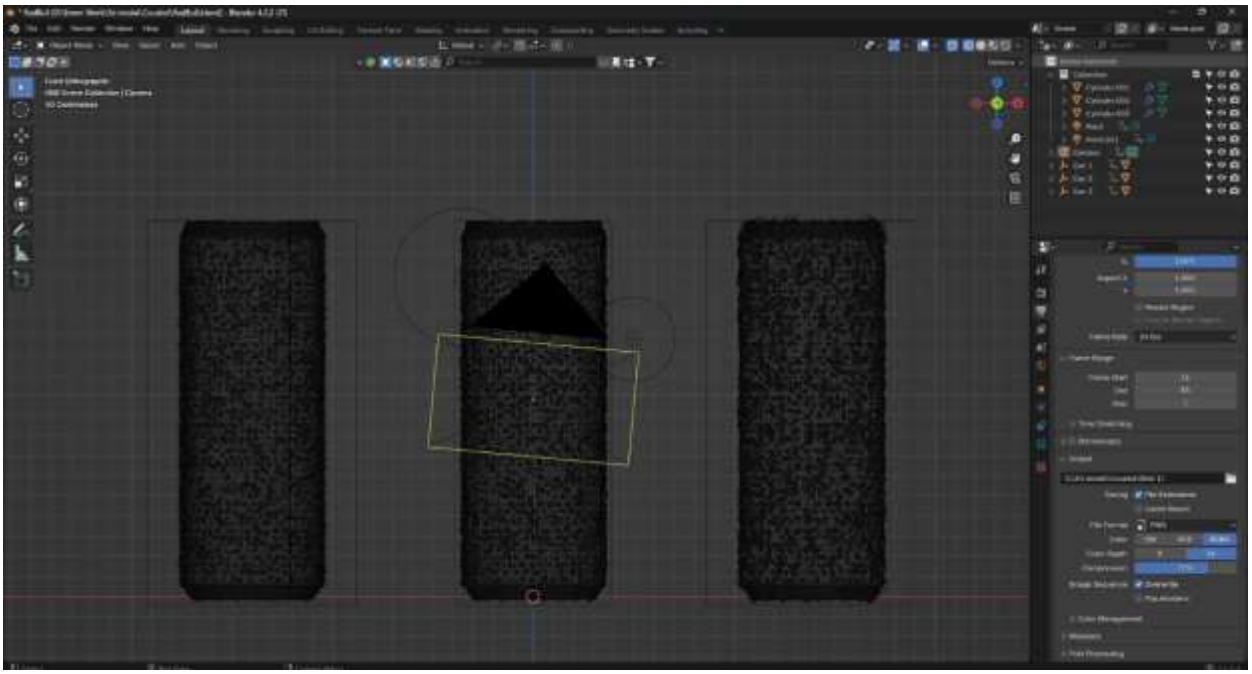

Figure 4.3.2: Wireframe of Soda Can

As doing the texturing of the soda can in Blender means putting on realistic materials and details characteristic of a regular can, simulating different parts of the body, top and bottom caps, and a pull tab using the Shader Editor with Principled BSDF shaders was done.

First of all, I took the body of the can as the base. For the body, a smooth metallic material was applied by means of a Principled BSDF shader. Metallic and Roughness values were set in such a

way as to make its surface reflective and to simulate a well-polished aluminum can. In addition, minor deviations on the surface were made by adding a Noise Texture, which is connected to roughness for the material to look less homogeneous.

For the top and bottom caps, I used a similar metallic shader but with slightly lower roughness to reflect the more matte finish typical of the edges of the can. I also tweaked the Base Color in order to give the caps a slightly darker metallic shade compared to the body, to give the appearance of a different material.

The pull tab had to be equally metallic, and so the same metallic shader was applied. I made it a bit worn by increasing the roughness, reducing the shine, to make it appear handled. To complete the texturing, I used UV mapping for design elements on the can, such as logos, text, and graphics. I have created an image texture in some program like Photoshop or GIMP and then applied it to the surface of the can. Care was taken while mapping the texture so that the design correctly shows up, specifically placing the logo in the correct position on the model. This image texture needed to be adjusted to fit around the cylindrical body without any stretching or distortion.

What followed was a duly textured soda can, with aptly metallic body and caps and slightly worn pull tab, along with a bright design wrapped around.

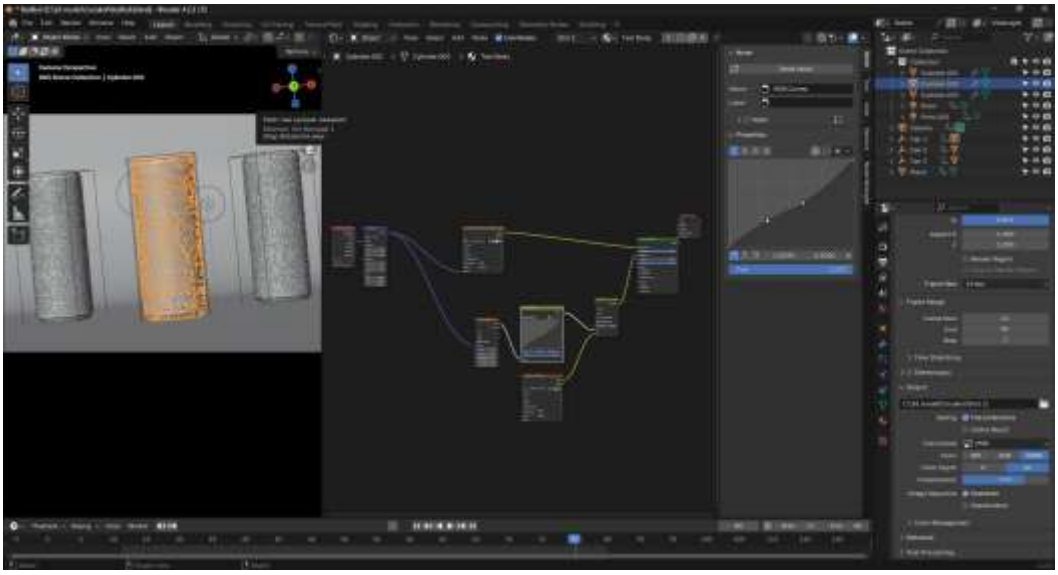

Figure 4.3.3: Texture Soda Can

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

Shot 1

Figure 4.3.4: Final Soda Can (1)

Shot 2

Figure 4.3.5: Final Soda Can (2)

Shot 3

Figure 4.3.6: Final Soda Can (3)

Shot 4

Figure 4.3.7: Final Soda Can (4)

4.4 Earth

In this project assign to me my supervisor or team leader Nahidur Abedin, He's sent me to make a hummer into a game asset. I took a reference from online. Here is my reference images.

Figure 4.4.1: Reference of Earth

I started by modeling the main components that make up the planet: the spherical shape, the continents, and the surface details.

For instance, I began by creating the Earth's basic form using a sphere. I decided to use the UV sphere option under meshes because it produces a nicely even geometry that sub-divides predictively. I then scaled the sphere for its proper proportions so that it did not look out of shape for a round-shaped planet.

After that, I worked on the continents. For that, I combined sculpting and displacement techniques: I applied the Subdivision Surface Modifier to the sphere for a more detailed curvature and started refining the surface in Sculpt Mode, creating the general layout of the landmasses. The continents

were to be distributed rather fairly, modeled to generally resemble realistic geography; that meant focusing on the rough shapes and positioning.

For the oceans, I did not have to make any changes to the spherical surface, other than a few minor adjustments. I did not need to model the oceans separately because they would later be represented by texture. However, for modeling purposes, I had to make sure that the continents were a bit raised above the level of the oceans to have a natural-looking separation.

I then sculpted mountain ranges and valleys with the different sculpting brushes. I used the inflate brush and smooth brush to add subtle peaks and valleys into the landmass, giving the continents a more dynamic, realistic appearance.

Finally, I refined the pole areas so that there wouldn't be any sharp or unnatural transitions. Smoothing the edges at the poles kept the sphere round.

Having the general surface and continents modeled, I had a basic shape of the planet, with everything needed to apply texturing on top and further details like an atmosphere and clouds.

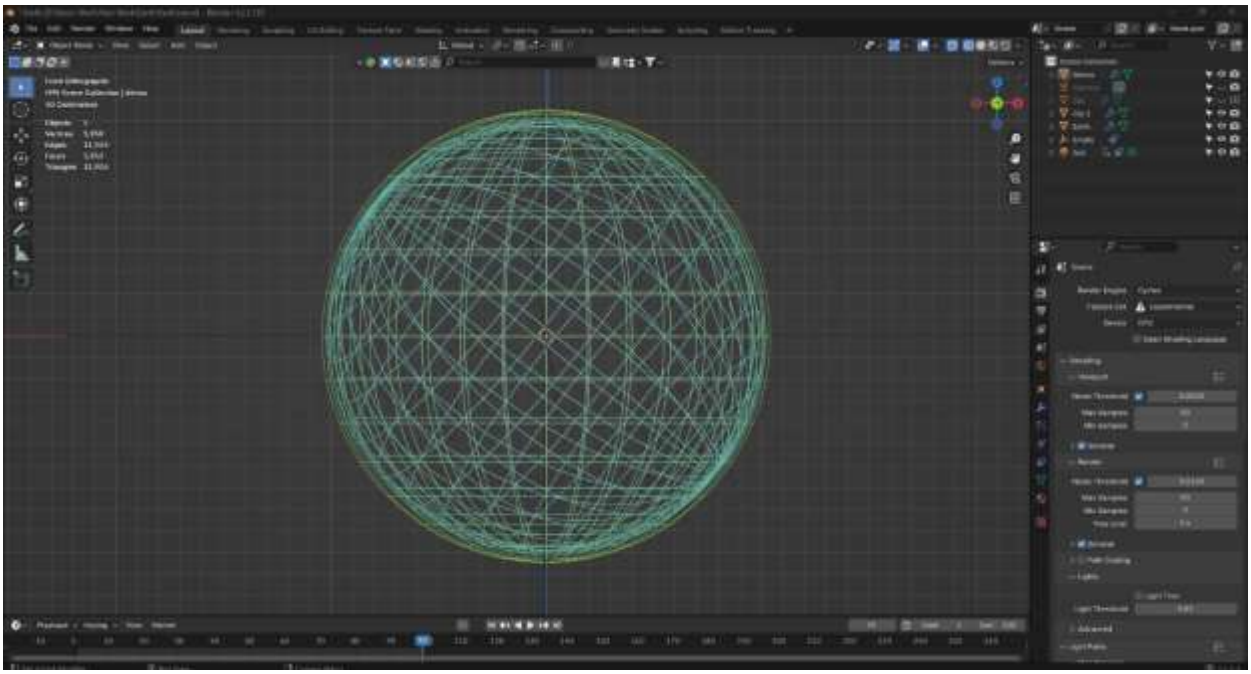

Figure 4.4.2: Wireframe of Earth

To texture the Earth in Blender, I paid more attention to realistic materials for the surface, oceans, clouds, and atmosphere using the Shader Editor and image textures. First, I applied a base texture for the Earth's surface. I used UV mapping and applied a high-resolution Earth texture map that included details for the continents, oceans, and other geographical features. This texture was used to map the Base Color of the Earth's surface, and I aligned it correctly across the sphere to avoid stretching or distorting it. I also adjusted the Displacement using a displacement map to enhance the topography of the continents, adding depth and realism by making the mountains and valleys more pronounced.

For the oceans, I used the same texture map but made sure that the water areas were well defined. Material-wise, the surface of the ocean is slightly reflective; I used a Principled BSDF shader with a low roughness to give it the smooth feeling of water. I also managed to fiddle with the Transmission value to introduce some transparency into it, similar to how water acts.

Proceeding with adding the clouds layer: the cloud texture is created using a transparent shader. It was applied on a sphere that was a bit bigger compared to the Earth's surface so as to surround the Earth. The semitransparency of the cloud allows it to show the lands and oceans of Earth where it lies. By tweaking the Density and Color Ramp in the shader, I had the softness in this cloud-like substance, fluffy clouds with a more or less change in opacity and lightness.

For the atmosphere, I applied a soft glowing effect using a volume scatter shader. I added a sphere, slightly larger than the Earth, to simulate the atmosphere. I fiddled with the Density and Anisotropy values until the glow of the atmosphere was subtle yet realistic-looking, enhancing the appearance of the Earth in space.

As a last step, I refined the lighting and environmental effects. HDRI lighting was used to realistically get the reflections and make sure that the Earth's surface and clouds would react naturally to light. This yielded a realistic, textured Earth with detailed continents, oceans, clouds, and atmosphere that captured the essence of our planet in 3D.

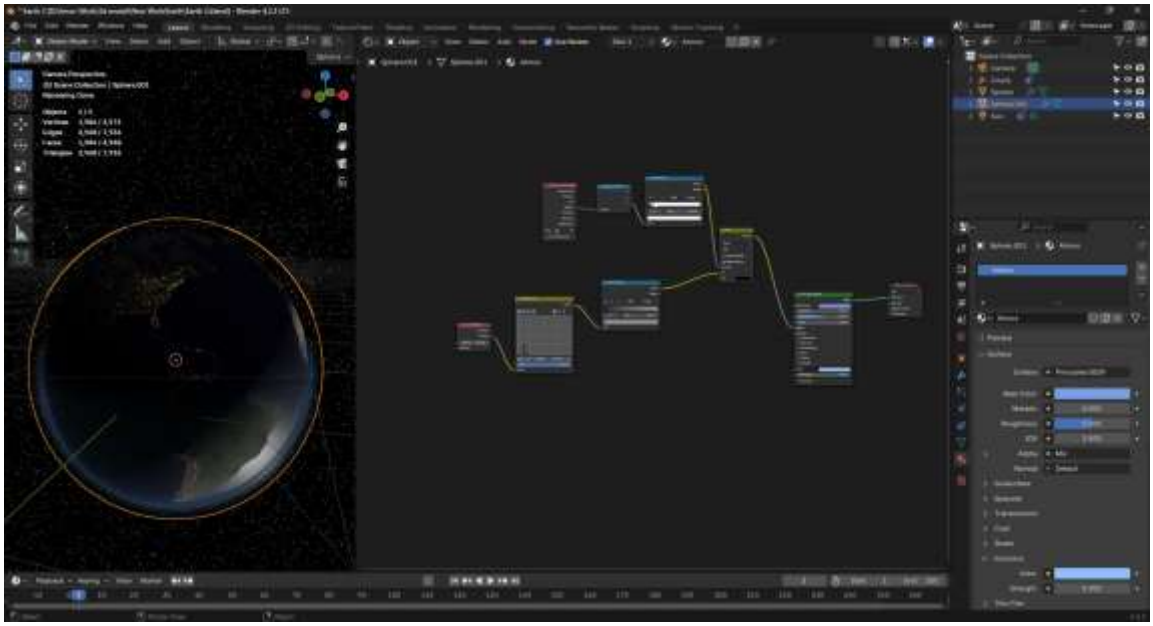

Figure 4.4.3: Texture of Earth

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

Figure 4.4.4: Final 3D Earth

4.5 Cosmetic products CGI

This project assigns to me my Intern supervisor Nahidur Abedin. They said to me create a Axe. Then I collect lot of image from online. Here is my reference image

Figure 4.5.1: Reference of Cosmetic Product CGI

For the cosmetic products, I broke them down into their most basic elements: bottles, caps, application devices, and other details such as labels or pumps. The body of the products was created using basic shapes, like cylinders, spheres, and cones. A lotion bottle might start with a cylinder that scales and extrudes to create the neck, while a compact could begin with a hemisphere for the bottom and lid.

The Subdivision Surface Modifier was used to make the surfaces smooth and polished, important for a premium look. Additional details, like grooves on the cap or indented sections on the bottle, were added with the Inset Faces and Loop Cut tools. Applicators, such as a lip gloss wand or pump nozzle, were modeled separately but detailed and in proportion.

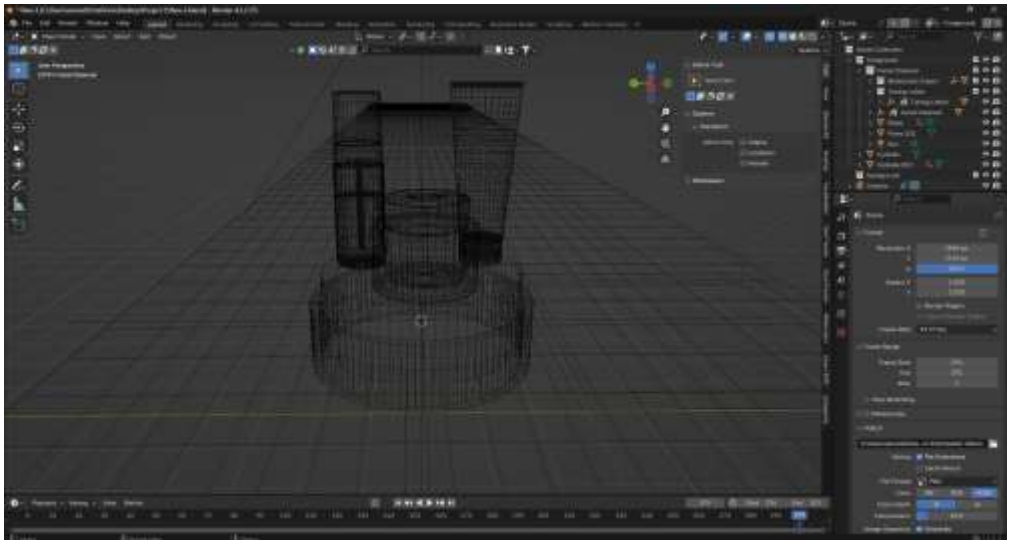

Figure 4.5.2: Wireframe of Cosmetic products CGI

Basic texturing was very important in bringing life into these products. Materials were created for the different parts that constituted the products, using the Shader Editor: everything from metallic finish for the caps using a Principled BSDF shader with high Metallic and low Roughness values, to putting a glossy or matte finish on the surfaces of the bottle as needed. UV mapping helped them get accurate label designs or logos that needed to wrap seamlessly around the bottles.

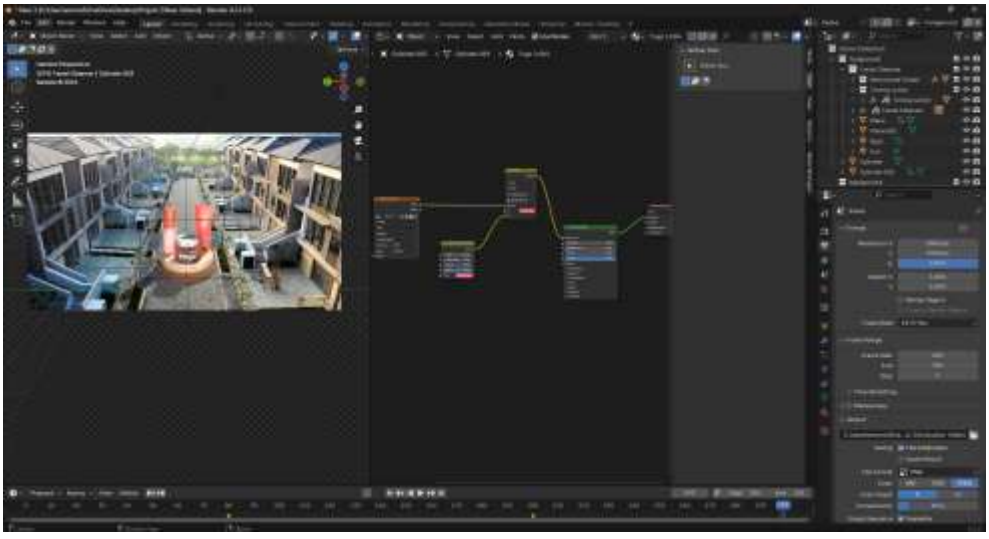

Figure 4.5.2: Texture of Cosmetic products CGI

To give prominence to the cosmetic product quality, I have set up HDRI lighting for realistic reflections and soft illumination. Additional area lights were used to emphasize main features: for example, a metallic sheen of a cap or very subtle texture of a matte bottle.

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

Figure 4.5.3: Final 3D Cosmetic products

4.6 Hammer

In this project assign to me my supervisor or team leader Nahidur Abedin, He's sent me to make a hummer into a game asset. I took a reference from online. Here are my reference images.

Figure 4.6.1: Reference of Hammer

After choosing my game asset, I started off with the handle of the hammer. Using a cylinder, I scaled it to the appropriate length and thickness for the handle. To give it a more organic, natural, and ergonomic shape, I applied the Subdivision Surface Modifier and changed the proportions to fit the real-life hammer handle. I then used the Sculpt Mode to add slight tapering toward the end where the hammer would be gripped, ensuring that the handle had a realistic and comfortable shape.

Next, I modeled the hammer head. I created a new cube and immediately scaled it into the general shape of the head. The head consisted of two parts: the striking face and the claw. First, I extruded the cube into a more rectangular shape. To the edges, I applied the Bevel Modifier, which rounded them off, making it more like the smooth angularity of a typical hammer head. I used the tool Inset

Faces to recess an area into the striking face and created some sort of depth in the head. The claw was modeled separately as a cylinder that had to be scaled and extruded to create the forked ends. I positioned the claw on the top of one end of the head, positioning it symmetrically.

The handle and hammer head were combined finally. I positioned the head squarely on the handle, using the Boolean Modifier to cut whatever shapes necessary for fitting on the head. I added a small reinforced ring near the top of the handle at which the hammer head attaches; this gave more structural integrity to the model and made it more realistic.

Once all the components were modeled and put together, I again used the Subdivision Surface Modifier in order to get rid of all the harsh edges and lock the shape of the hammer. The result was a clean, accurate 3D model of a hammer, ready for further detailing or texturing.

Figure 4.6.2: Wireframe of Hammer

Texturing the hammer in Blender was all about adding realistic materials to each component: the handle, head, and claw. Using the Shader Editor, I worked with Principled BSDF shaders and image textures to achieve realistic surface appearances for each part.

First, I added a texture to the handle of the hammer. Since it's usually made of wood, I chose a wood texture to simulate the grain and other natural imperfections of the material. I applied the texture by using UV mapping, making sure to carefully align it so that the grain ran along the

length of the handle. To make the wood look realistic, I've used a higher value for material Roughness to simulate an untreated wood matte finish. I have also applied slight bump mapping in order to have subtle surface detail, adding to the realism of the wood texture.

For the hammer head, I wanted to apply a metallic texture, for it would be made of steel or iron which is used as the striking surface. Material: Principled BSDF Metallic value at 1 Roughness adjusted to a lower value to give the head a smooth, polished surface. To add some texture, I wanted to add a bump map to it, simulating minor surface imperfections-scratches and dents-on real-life hammer heads. For the striking face, I have kept this smooth to retain the effect of the metal being high shine, while for the sides of the head it had subtle imperfections.

For the claw, I used the same metallic shader as the head, so that the metal parts would look consistent, but I increased the roughness a bit to give it a more matte and worn look, as if it would have friction and wear during use.

For finishing, some adjustments had to be made in lighting and HDRI environment to make materials act according to real-life light interactions. This really made the metallic sheen of the hammer head and the smooth, matte finish of the wooden handle pop. Thus, this results in a realistic and well-textured hammer representative of both wood and metal.

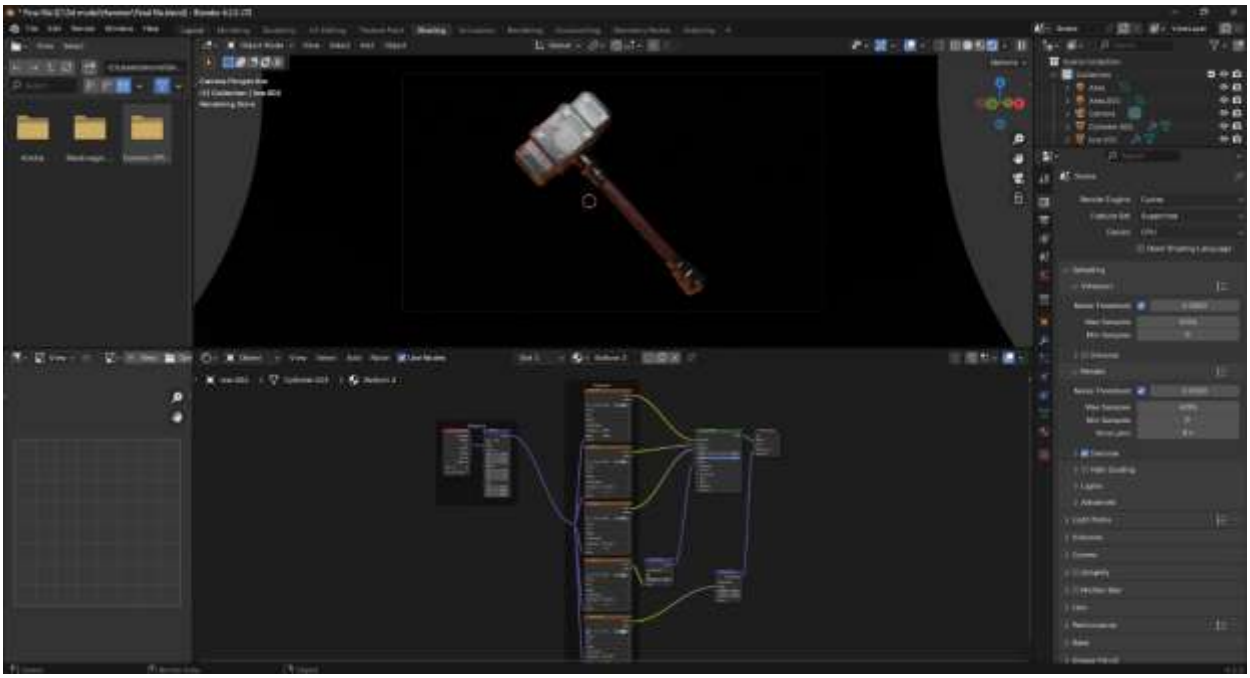

Figure 4.6.3: Texture Adobe Substance 3d Painter of Hammer

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

Figure 4.6.4: Final 3D Hammer

4.7 Hurricane Lamp

In this project assign to me my supervisor or team leader Nahidur Abedin, He's sent me to make a hummer into a game asset. I took a reference from online. Here are my reference images.

Figure 4.7.1: Reference of Hurricane

I started with the main elements of the lamp, which include the base, the glass enclosure, and the wick holder. I started modeling the base, for which I used a cylinder. I scaled it to the desired height and diameter to form the main structure. To give the base a more realistic look, I added a slight bevel to the edges, making them smooth and rounded.

Next, I modeled the glass enclosure. I used another cylinder for the body of the glass. It was scaled and stretched to achieve the standard shape of a hurricane lamp, making sure that the proportions were right. Then I selected the top and bottom faces of the cylinder and extruded them to create the openings at both ends of the glass. To give thickness to the glass, I applied the Solidify Modifier; this added the inner and outer walls of the glass, making it more realistic.

These would include much smaller cylinders for the wick holder within the glass I've been trying to envision. A little scaling, extrusion created the central and outer structure that surrounds this holder. That would go in its traditional location inside the enclosure of glass, and I create a small cylinder inside its middle for the wick and make sure to line it up with everything else there in the lamp model.

Next was to position everything together in such a way that it would come really close to looking like a real hurricane lamp: the base and the glass fitting, the wick holder fitting nicely. The final result is a clean, accurately modeled hurricane lamp, ready for further detailing or rendering.

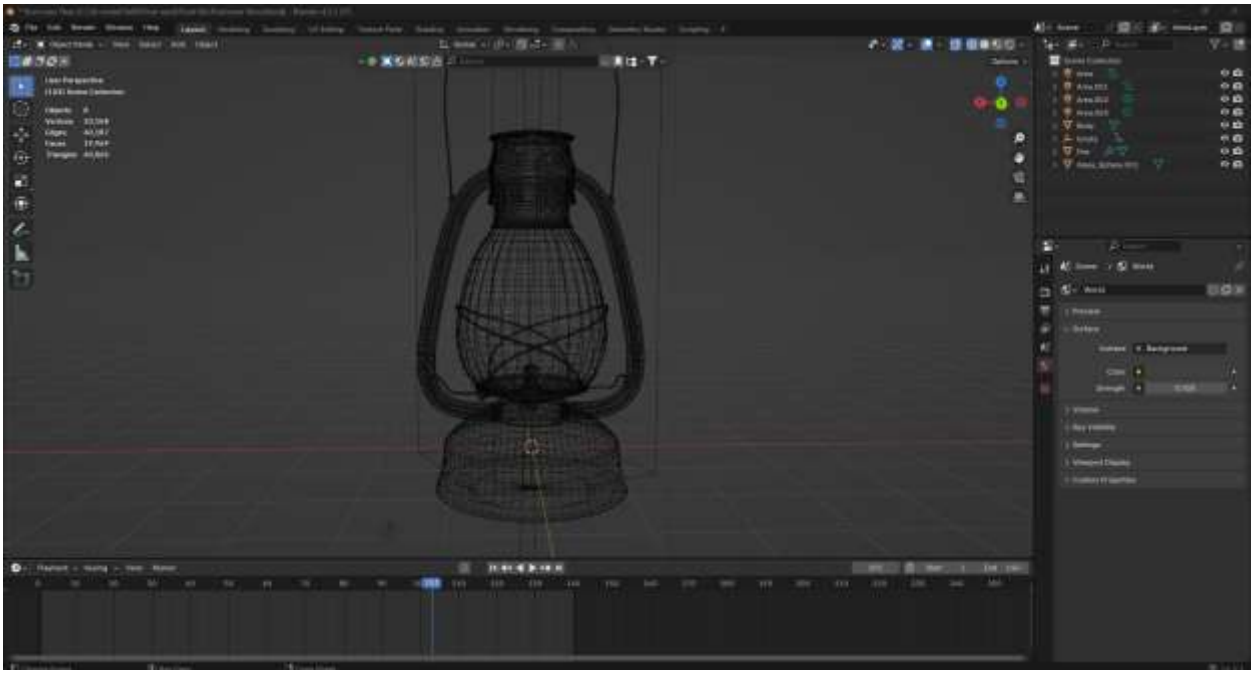

Figure 4.7.2: Wireframe of Hurricane

I started by creating realistic materials for each part of the lamp: the base, the glass enclosure, and the wick holder. First, I started selecting the base of the lamp, modeled by using a cylinder. Then, I added the material through texturing, choosing a metallic material to simulate the metal finish. I added roughness to give it a somewhat shiny look but at the same time having it similar to a polished metal surface. On the base, I only did a simple solid color with slight modifications in order to show the shining effect.

The second thing was to design the glass enclosure. In the Shader Editor, a glass shader was applied to provide transparency for a realistic effect of glass. I used the Principled BSDF shader, setting

the Transmission value to 1 for full transparency and adjusting the Roughness to make the glass slightly frosted. This helped create a soft, realistic look, as if the glass had some wear and tear. I also added a subsurface scattering effect to give the glass a more lifelike appearance, as glass typically has a slight scattering of light through its material.

The geometry consists of small cylinders for the holder and wick itself. Metallic material was applied on the wick holder for which I managed its roughness to have a subtle reflection in metal. The shader used here on the wick is simply a diffuse basic, but I made some kind of cloth-like glossy texture for the same. Light color is used for the wick to keep in uniformity with the traditional appearance of the hurricane lamp.

Lastly, I adjusted the lamp's lighting to better realize materials. I used HDRI for natural light and put a soft point light inside the lamp, which represents the glow of the flame. In such a way, materials looked natural and glass and metal reflected properly. The hurricane lamp was already there with convincingly simulated metal, glass, and fabric; it was a realistic model and a visually pleasing one.

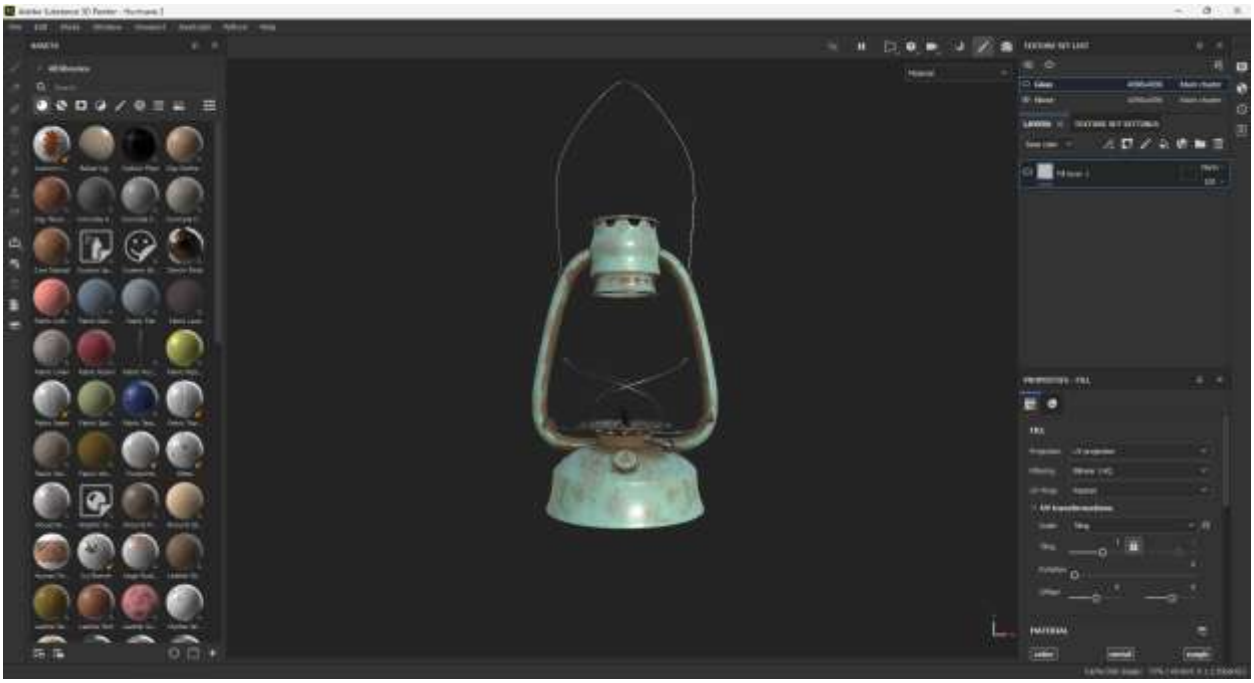

Figure 4.7.3: Texture of Hurricane Lamp

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

Figure 4.7.3: Final Hurricane Lamp

4.8 Axe

This project assigns to me my Intern supervisor Nahidur Abedin. They said to me create an Axe. Then I collect lot of image from online. Here is my reference image

Figure 4.8.1: Reference of Axe

I started with an axe blade by modeling it from a cube, scaling, and extruding to form the sharp edge and body of the blade. After refining the form, I added edge loops, smoothing out the edges with the bevel tool. With proportional editing, I added a tiny curvature to the cutting edge of the blade to make it very sharp and realistic.

I start making the handle by creating a cylinder, editing its length and thickness to fit the blade. Then I took the sculpting tool and added slight curves for a more natural look of wood. Add edge loops to the handle and scale down parts to represent grip or wrapping. Finishing my axe model.

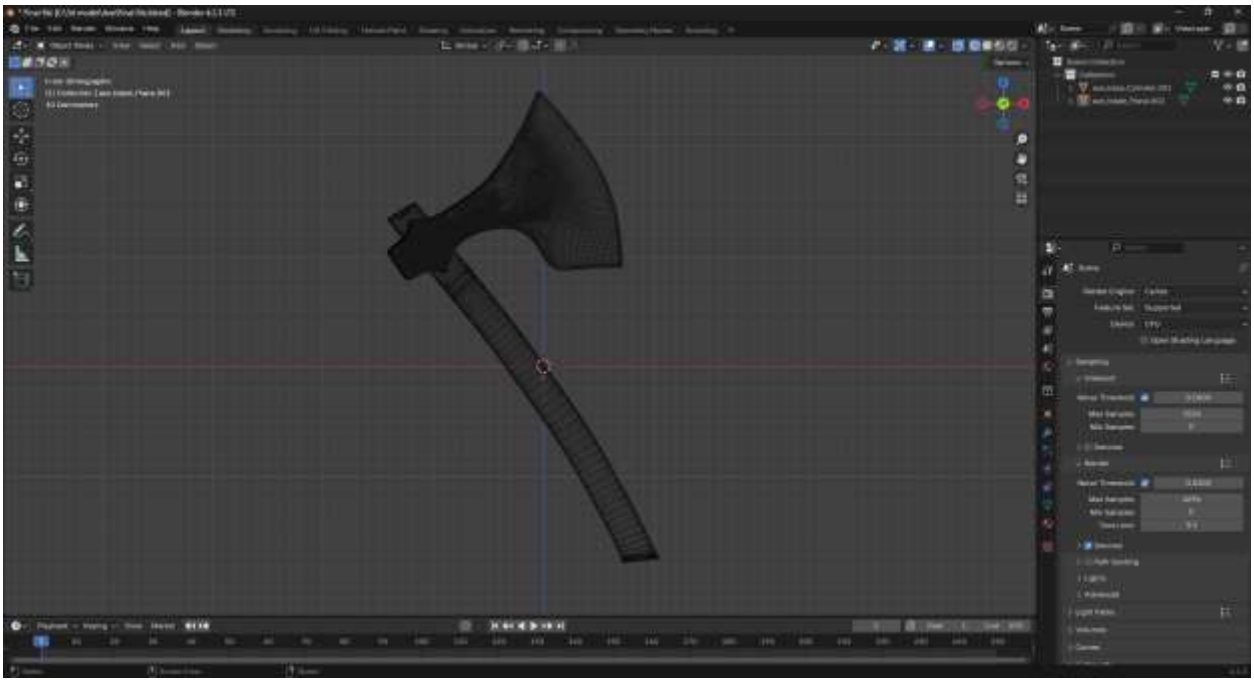

Figure 4.8.2: Wireframe of Axe

With the model created in Substance Painter for texturing, detailed and realistic textures were added to the axe model. First, the model was imported, the mesh maps were baked, and texturing of the blade for a metallic look that was worn and aged was started. Scratches, rust, and dirt were added in strategic places to show natural wear, especially near the edges.

Material-wise, for the handle, I utilized a wood material with a natural grain texture. I customized it to show imperfections, adding dirt and scuff marks to indicate frequent use. Thus, combining procedural materials with smart masks and manual adjustments, I achieved a balance of realism and artistry.

The final textured axe looked weathered, functional, and ready for a game environment; the blade and handle complement each other through their detailed finishes.

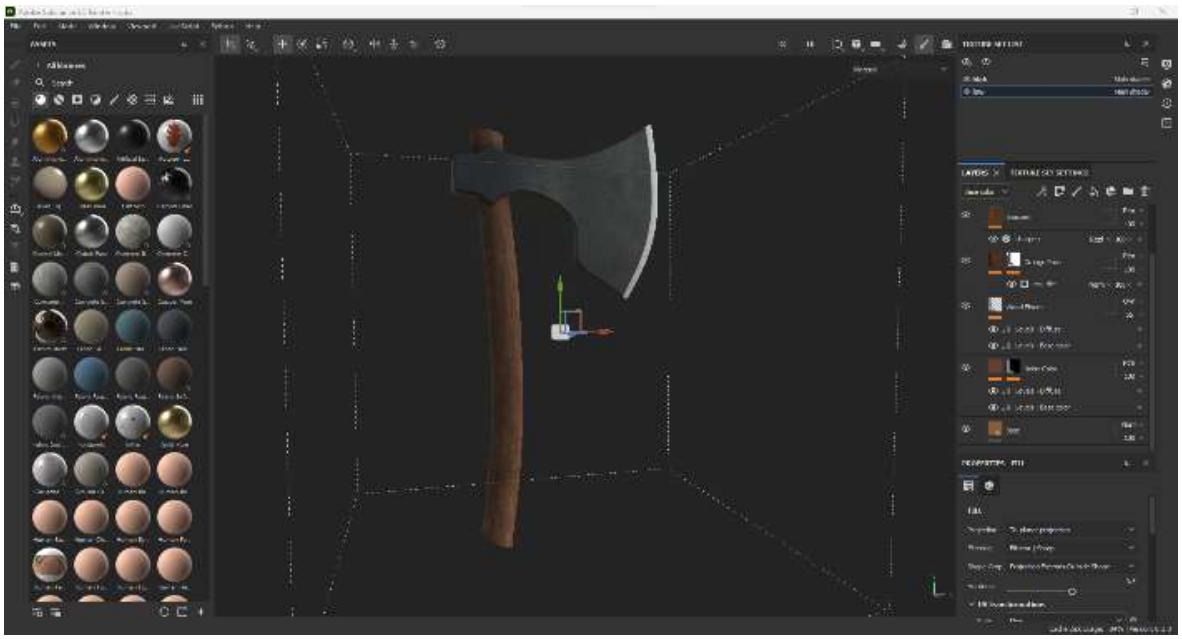

Figure 4.8.3: Texture Adobe Substance 3d Painter of Axe

I took my model back to Blender to render. After lighting I setup my render settings and rendered it. Here is my final output of Axe. I created post-production worked in Photoshop.

Figure 4.8.4: Final 3D of Axe

4.9 Sword

MY Intern supervisor Nahidur Abedin. They said to me create a Sword. Then I collect an image from online. Here is my reference image

Figure 4.9.1: Reference of Sword

To make the sword, I started by modeling the blade. With a cube, I scaled and stretched it into a thin rectangular shape. I added edge loops down the length of the blade and used proportional editing to taper the edges of it, sharpening it. For added detail, I created a fuller-the groove running down the blade-by selecting faces and extruding them inwards.

Next, I modeled the hilt. I started with a cylinder for the handle and changed its proportions accordingly to fit the blade. I began to add grip details by adding edge loops and scaling them to simulate wrapping or texture. The guard and pommel were created from basic shapes like cubes and spheres, extruded and beveled to fit the style of the sword.

The model was smoothed and modifiers like bevel and subdivision were used to refine the edges and curves after finalizing the shape. Finally, the prepared sword model was ready for texturing and rendering.

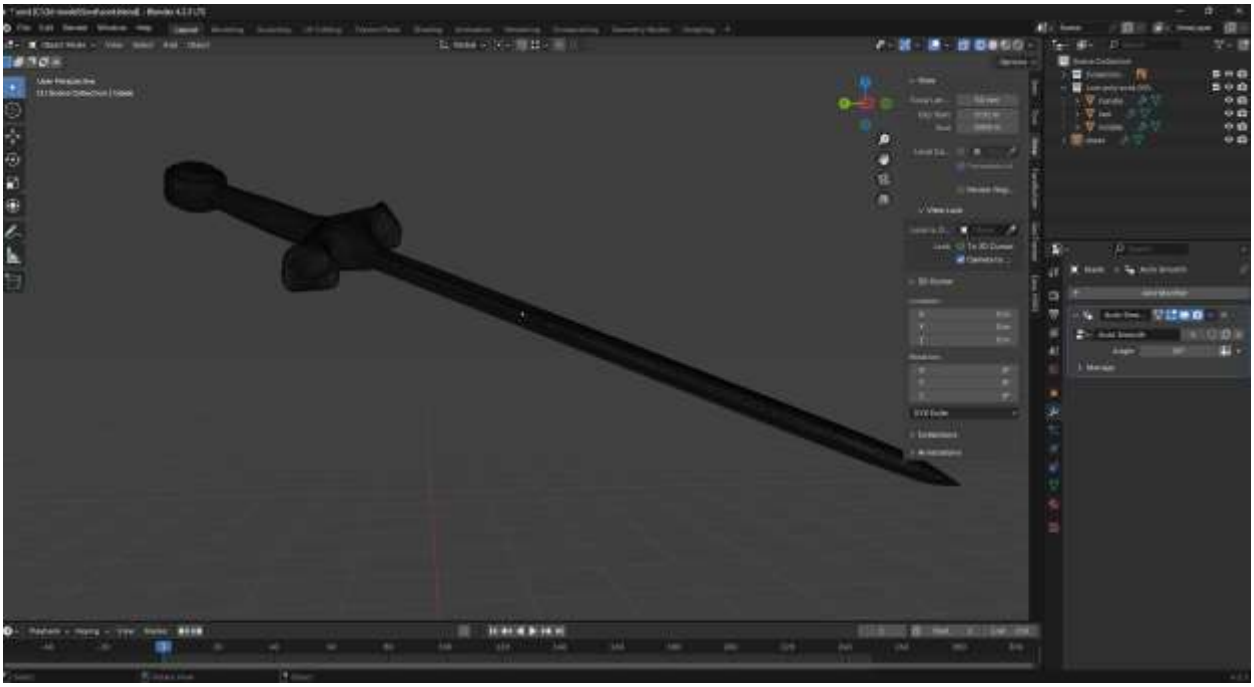

Figure 4.9.2: Wireframe of Sword

I imported the sword model in Substance Painter and started baking the mesh maps for ambient occlusion, curvature, and normal map details. A base material of metal was used for the blade with low roughness to give it a polished steel appearance. Scratches and wear on the edges were added using procedural masks and brushes, giving that realistic look to a used blade. Light dirt applied in the fuller gave emphasis to its depth.

For the handle, I used a leather material, for which I adjusted the color and roughness to appear aged but still durable. I added fine details of stitching and texture for grip by using a normal map. Subtle dirt and wear were applied to places that would show frequent contact. The guard and pommel were given a material of bronze or iron, adding some patina and slight rust effects to balance out wear with polish.

I then used smart masks to enhance wear and tear, focusing on edges and corners, and adjusted the lighting to preview the textures. Once satisfied, exporting of textures in the required formats followed.

The sword now has a detailed, realistic appearance, ready for rendering or integration into a game.

Figure 4.9.3: Texture Adobe Substance 3d of Sword

I took my model back to Blender to render. After lighting I setup my render settings and rendered it. Here is my final output of Axe. I created post-production worked in Photoshop.

Figure 4.9.3: Final 3D Sword

4.10 Revolver

In this project assign to me my supervisor or team leader Nahidur Abedin, He's sent me to make a Gun into a game asset. I took a reference from online. Here are my reference images

Figure 4.10.1: Reference of Revolver

First of all, I started modeling the barrel from a cylinder, edited its proportions to get a shape close to the reference picture, then added some edge loops, inset, and extruded the parts to model the muzzle and internal bore. Then, I created a cylinder for the cylinder chamber and added subdivisions. Carefully modeled the bullet chambers by selecting the faces, in-setting, and extruding them inside.

I made the frame of the revolver from a cube, scaling and shaping it to fit around the barrel and cylinder. Using edge loops, extrusions, and bevels, I sculpted the frame's curves and mechanical details. The trigger and hammer were modeled separately but from basic shapes, like cubes and cylinders, and then refined with the knife and bevel tools.

For the grip, I started with a cube, carving into it a comfortable, ergonomic shape. I added realism with details such as screws, small indents, and very subtle curves. I made sure all the parts were proportionally accurate and placed according to the reference.

Smoothing, applying modifiers wherever necessary, and preparing the model for texturing and rendering was done last. A very detailed and realistic model of a revolver was now realized, ready to be further refined or used in-game.

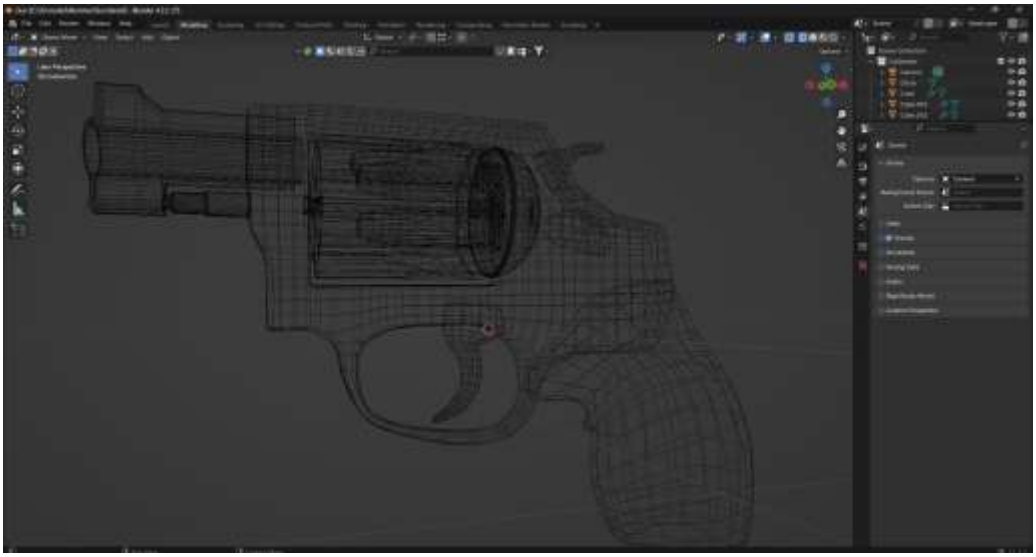

Figure 4.10.2: Wireframe of Revolver

After finishing the revolver model, I began texturing it in Blender with the Shader Editor. I started with the barrel and cylinder, using a metallic material by raising the metallic value and changing the roughness to make it look like slightly worn, polished steel. To make it look more real, I used a noise texture linked to a bump map for small surface flaws like scratches and dents.

The frame was then given a darker metal material, contrasting the barrel with added procedural wear effects on edges using a color ramp and ambient occlusion nodes. These effects simulated paint wear or polished areas from handling.

For the grip, I used a wood texture. I made sure the wood grain matched the curves of the grip using a UV map. I added a bump map to make the grain stand out and changed the roughness to

make it look a bit worn from use. To add more detail, I created small scratches and dirt in places that are often touched.

To finish the textures, I used Blender's viewport shading to see how the materials looked in realistic light. After adjusting the settings, the revolver looked detailed and realistic, ready for rendering or use in a game.

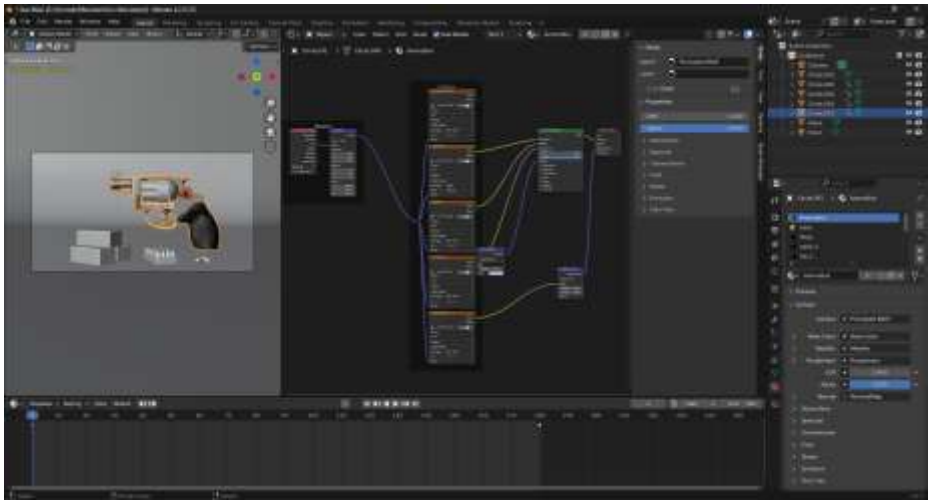

Figure 4.10.3: Texture of Revolver

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

Figure 4.10.4: Final 3D of Revolver

4.11 Traffic Item

My supervisor or team leader Nahidur Abedin, He's sent me to make a Traffic Item into a game asset. I took a reference from online. Here are my reference images

Figure 4.11.1: Reference of Traffic Item

I started with a specific object, let's say a traffic cone, a barrier, or a sign, and downloaded some reference images to get the actual dimensions and details. Started modeling with basic shapes: a cone for the traffic cone or a cube for a barrier, then refined it with tools like scaling, extrusion, and beveling.

For a traffic cone: I modeled the base from a cylinder and scaled it outward slightly to create a stable bottom. The cone itself was modeled by extruding and tapering a cylinder into a conical shape. Edge loops were added to define areas for details like grooves or bands.

For a traffic barrier: I started with a rectangle base and added edge loops to form curves and indentations; then I used the inset tool to add grooves or slots for a realistic appearance. I added details such as bolt holes or reflective strips for realism.

I used modifiers like bevel for smooth edges and subdivision for added detail where needed.

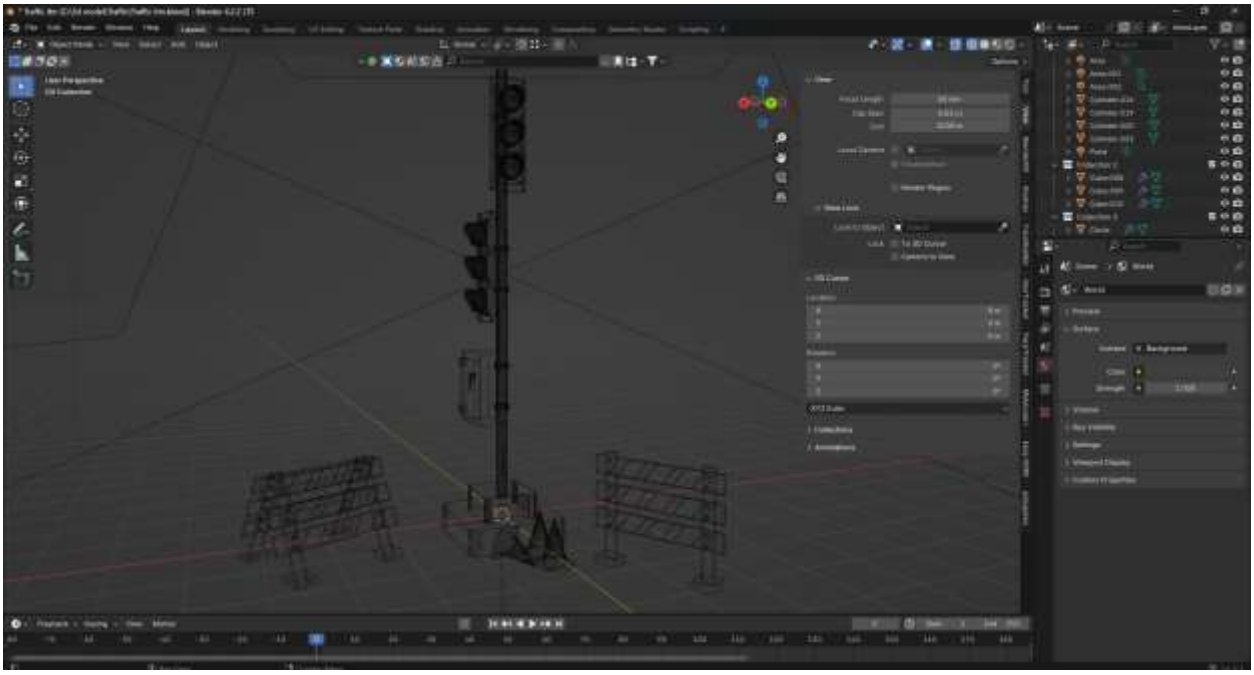

Figure 4.11.2: Traffic Item of wireframe

Having the model of the traffic item finished, I moved on to texture it in Blender using the Shader Editor. I first started out with applying base materials to parts of the object. For example, for a traffic cone, the base was given a material something like rubber with low roughness and a dark color; the cone itself had a bright orange color with a glossy finish to make it look more like plastic.

I used procedural textures to add realism in the details. For example, I used a noise texture linked with a bump map on the cone, to get small-scale surface imperfections. I also used a color ramp to subtly vary the orange hue to make it look less monotonous and more organic.

I added an emissive shader to the reflective strips and warning signs to simulate their reflective properties. I made sure the textures, like stripes or logos, were properly aligned by UV unwrapping the model. I combined image textures with procedural nodes to achieve dirt, scuff marks, or faded paint where it would naturally wear off over time.

Lastly, I previewed the textures under realistic lighting in the viewport and fine-tuned the shaders to get the look I wanted. The result was a detailed and lifelike traffic item ready for rendering or integration into a scene.

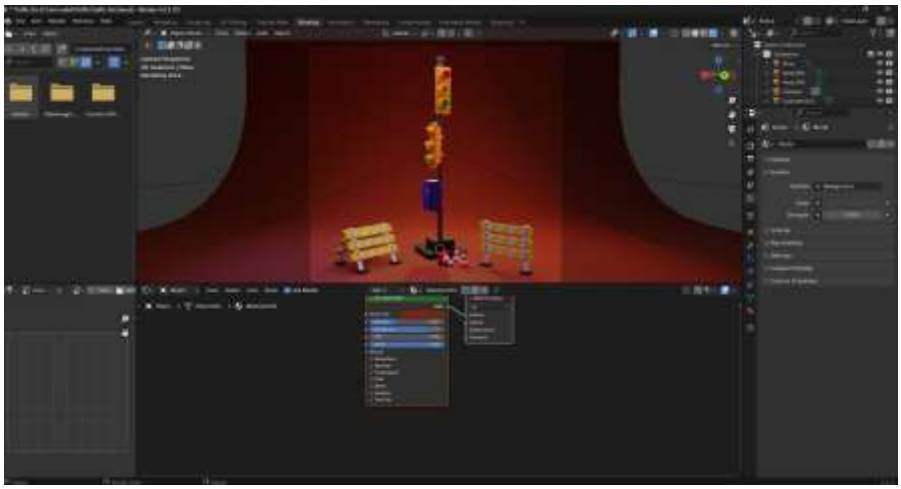

Figure 4.11.3: Texture of Traffic Item

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

Figure 4.11.4: Final Traffic Item

4.12 Barrel

In this project assign to me my supervisor or team leader Nahidur Abedin, He's sent me to make a barrel into a game asset. I took a reference from online. Here are my reference images.

Figure 4.12.1: Reference of Barrel

Fast of all, I started with a simple cylinder for the main body. I changed its dimensions to make it in proportion to a normal barrel, slightly scaled along the center to get that rounded bulge. Then I used the loop cut to add edge loops to create divisions for the wooden planks and metallic bands.

I used those to help define the metallic bands by selecting a few edge loops and extruding them outward a bit and scaling for thickness. For the wood, I used the small bevels on the edges to give it separation between each plank.

I then used the Inset command on the faces of the cylinder to extrude them inward, so the lid and base looked deep in the barrel; I also made small details grooves and wear with the Knife tool and sculpting brushes.

Once the modeling was complete, I cleaned up the mesh and applied a subdivision surface modifier to smooth out any sharp edges while keeping the structure of the barrel intact. And that's it. Modeling is done.

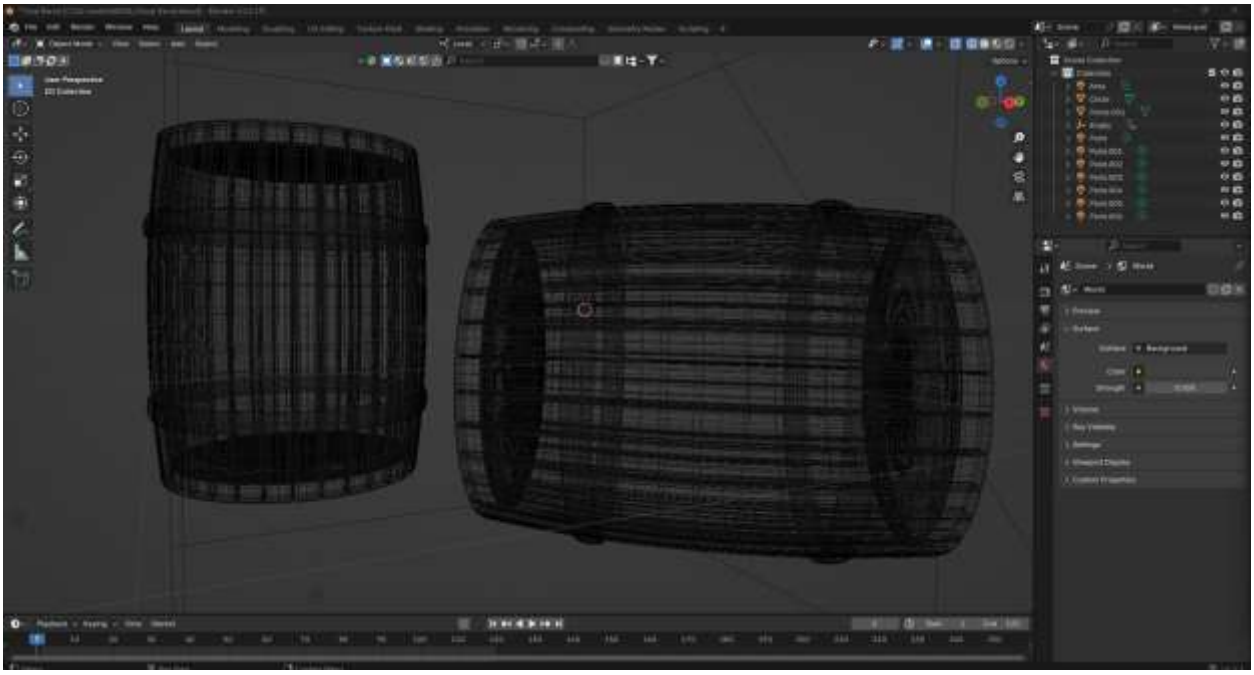

Figure 4.12.2: Wireframe of Barrel

First of all, I imported the barrel model into Substance Painter and baked the mesh maps in order to generate details such as ambient occlusion, curvature, and normal maps. For the wooden planks, I applied a wood material and customized the color to match the grain pattern in order to resemble aged timber. I used a roughness map to add slight variations so that the wood looked weathered and natural.

I also added dirt and scratches along the edges and crevices with smart masks to enhance realism, making it look like the barrel had actually been used and handled over time. On the metallic bands, I picked a steel material and adjusted the roughness and metallic values so that they look slightly worn and rusty. I added more rust and grime with procedural masks for areas where water or handling would naturally corrode.

Lastly, I adjusted the general lighting to preview the textures under realistic conditions. Finally, I exported the texture maps in the needed formats. The textured barrel looked detailed and aged, good enough for a game or a rendered scene.

Figure 4.12.3: Texture Adobe Substance of Barrel

I took my model back to Blender to render. After lighting I setup my render settings and rendered it. Here is my final output of Axe. I created post-production worked in Photoshop.

Figure 4.12.4: Final 3D Barrel

4.13 Mini Sword

My supervisor or team leader Nahidur Abedin, He's sent me to make a Traffic Item into a game asset. I took a reference from online. Here are my reference images

Figure 4.13.1: Reference of Mini Sword

I began by modeling the blade. I started with a cube as a base shape and scaled and elongated it to a thin, flat structure. I added some divisions along the blade with edge loops and moved the vertices to taper the edges to be sharp and pointed. I in-set the face and extruded it inward a little bit to create a fuller, which is a groove running along the blade for further detailing.

The guard was made from a cube, which I scaled and shaped into a cross guard. Beveled the edges to make them smooth and polished. I used a cylinder for the handle, scaled in size to the blade, adding grip details with edge loops, inserting, and slightly scaling the sections to appear as wrapping. The pommel was created using a sphere or cube, further refined with the bevel tool for smoothness.

Once the model was complete, I used modifiers like subdivision surface and mirror to ensure symmetry and refine the overall shape.

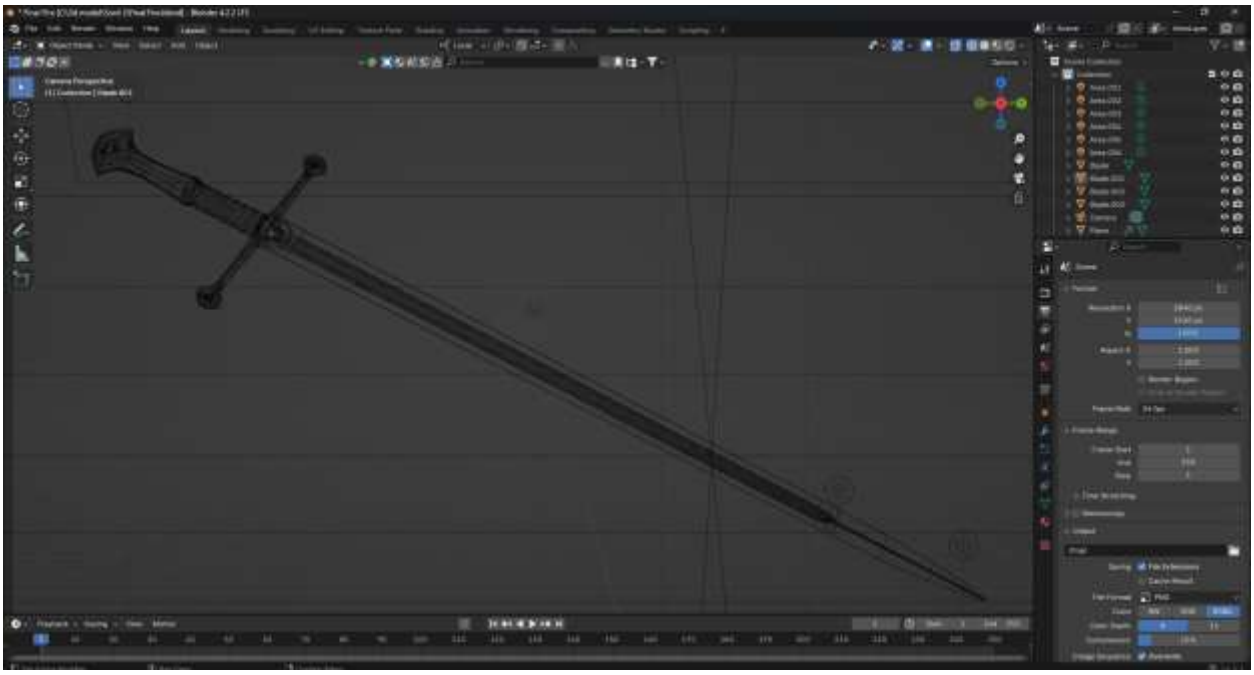

Figure 4.13.2: Mini Sword of wireframe

After modeling the mini sword, I started texturing it within Blender using the Shader Editor. First, I worked on the blade: I applied the metallic shader to it by just increasing the value of metallic and decreasing the roughness. To simulate realism, a noise texture is used with a bump map, which gives a subtle scratch on the surface.

I textured the guard with a metallic material, but with slightly higher roughness to make it look older and less polished. Then I added a procedural simulating wear over the edges and the area where one could hold the guard or hit with it.

For the handle, I created a leather-like texture using a procedural noise texture mapped to simulate the grain and imperfections of leather. I adjusted the roughness to make it look slightly worn and added a bump map to enhance the grip detail.

The pommel was given a polished metallic material to contrast with the rougher guard. I also added slight tarnishing using a color ramp and noise texture, which made the metal more realistic.

After UV mapping, I aligned the textures. I previewed the mini sword in Blender's viewport under good lighting. The textures brought life to the model, and it looked very realistic and well-used.

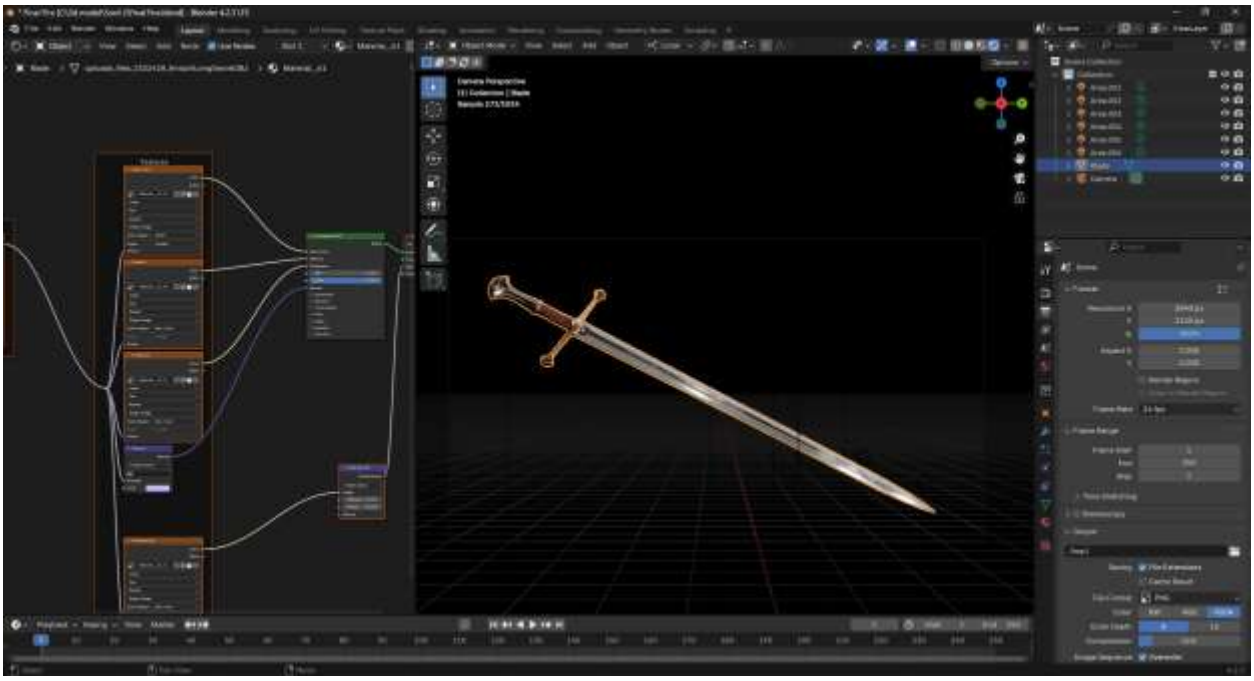

Figure 4.13.3: Texture of Sword

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

Figure 4.13.3: Final 3D Sword

4.14 Tree House

My supervisor or team leader Nahidur Abedin, He's sent me to make a Traffic Item into a game asset. I took a reference from online. Here are my reference images

Figure 4.14.1: Reference of Tree House

To create this treehouse in Blender, I started with the tree as a base: a cylinder to which I applied proportional editing in order to shape it and give it a more natural look. The branches are made from extrusions, so the house could be supported. For the foliage, I just used basic sphere shapes, slightly scaled and sculpted to make them look more like cartoonish, stylized leaves.

I made the treehouse structure using simple shapes. I used cubes to model the house and planks for the platforms. The roof was created using a triangular prism, and I added details such as the ladder, railings, and tire swing for character.

Lastly, grasses and small plants were added using Blender's particles system to scatter geometry. I made the base circular, just to give it a diorama-like feel. And finally, I tweaked the materials for a stylized look using flat, vibrant colors and smooth shading. Finally, model is finished.

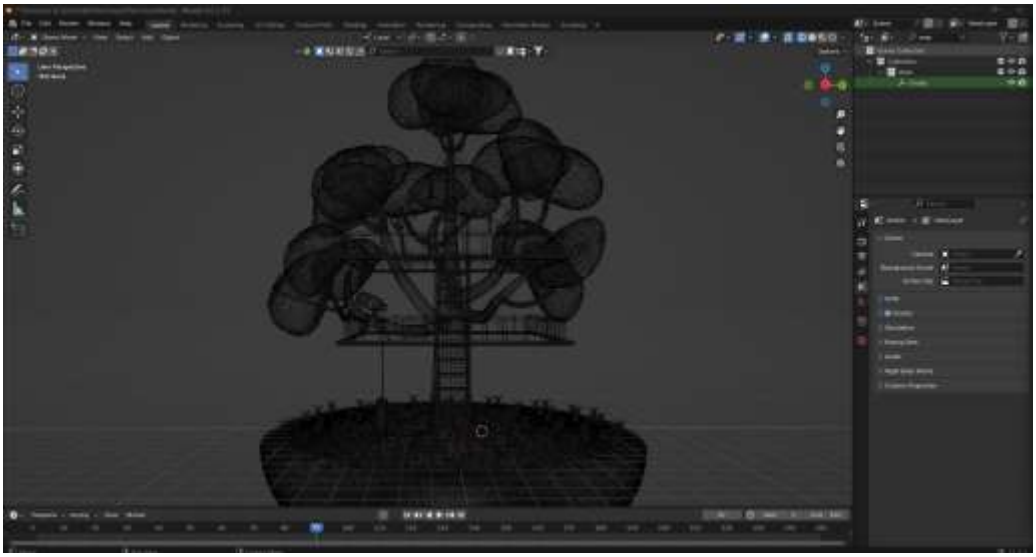

Figure 4.14.2: Wireframe of Tree House

Moving on from modeling the treehouse, I went into texturing in Blender using the Shader Editor. I applied a procedural wood texture to the tree trunk and branches, adjusting the noise and color ramp to achieve this stylized bark look. Then, I tweaked the roughness to make the surface look a little bit matte and organic.

For the foliage, I used a simple green material with a noise texture to add subtle variations in color, making it look like leaves would naturally. I added slight bump mapping to give them texture while keeping the stylized look.

The treehouse structure itself was textured using a wood material and changing just the color and roughness values so it's distinguished from the trunk. Metallic details such as nails and fasteners were assigned a metallic shader with low roughness to give a bit of shine.

For the grass and the ground, I used green material for the grass and a brown slightly rough texture for the ground. I added noise to simulate natural unevenness. Finally, texturing is done.

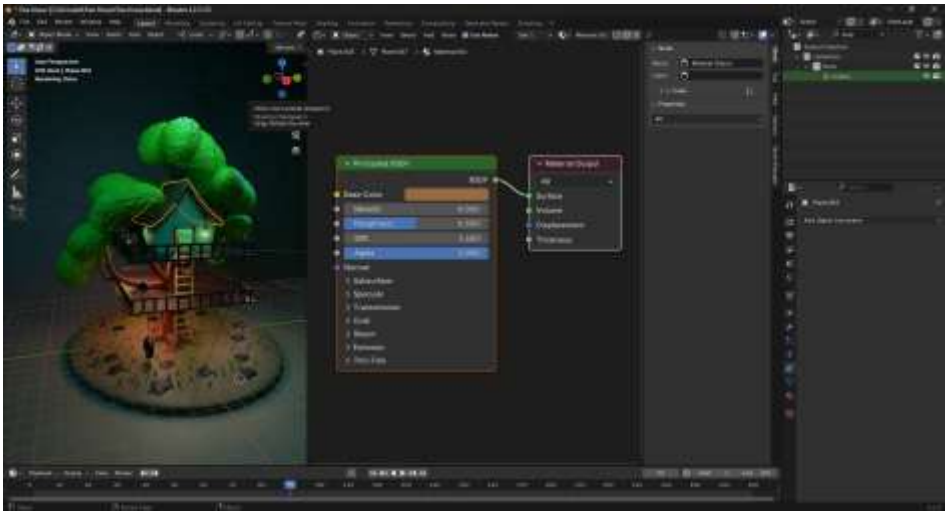

Figure 4.14.2: Tree House wireframe

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

Figure 4.14.3: Final 3D Tree House

4.15 Popcorn Van

My supervisor or team leader Nahidur Abedin, He's sent me to make a Traffic Item into a game asset. I took a reference from online. Here are my reference images

Figure 4.15.1: Reference of Popcorn Van

First, I blocked out the main components using simple shapes, just getting an idea of the structure. The base of the cart was modeled using a cube, which I then scaled into a rectangle to get the main body. I used cylinders for the wheels and added edge loops and bevels to get spokes for a realistic look. I extruded the axles and supports from smaller cylinders and aligned them with the structure. The popcorn compartment was made from another cube, scaled and modified into a hollow box with glass material applied. I used the Shader Editor to assign it a transparent shader; now it looks like the most realistic glass ever. The popcorn would be made from small spheres, scattered with a Particle System to look like popcorn filling up the compartment. I used randomized scaling and rotation to add natural variation to the popcorn pieces.

The roof was modeled by combining a cone for the top with a beveled cylinder for the trim, so it would smoothly get a rounded finish. I also added some decoration elements, such as the striped poles, scaling down cylinders and painting them with materials in a red and white pattern, giving it that vintage carnival theme. I extruded the popcorn tray and its small details, such as the handle and popcorn scooper, from simple shapes like cubes and cylinders.

I did texture in Blender's Shader Editor: bright, fun colors like yellow, red, and white were used to make the cart visually interesting. The text on the body was mapped with UV and added with a texture image. The scene was rendered using the Cycles render engine with HDRI lighting for a realistic view with reflections and soft lighting.

Lastly, I created a simple plane for the ground and changed the camera to an interesting angle. The final popcorn cart balances realistic modeling against a playful, stylized feel.

Figure 4.15.2: Wireframe of Popcorn Van

Texturing in Blender is a crucial step to bring a 3D model to life. First, I unwrap the model; that is, I flatten its 3D surface into a 2D plane. I do this under the UV Editing workspace, where I select the object and then use the "Unwrap" function. This ensures the textures will be correctly applied over the model's surfaces.

From there, I go to the Shader Editor, where I create the materials for the model. Principled BSDF is a very versatile shader, controlling how the material will interact with light, defining its color, roughness, and reflectivity. I add an Image Texture node, which allows me to apply an image file to the model, like a texture map, logo, or any other surface detail. This node is connected to the Base Color of the shader, which gives the appearance to the model.

I can also use procedural textures, like noise or wood grain, if I need more control over the texture or a more stylized look. Procedural textures are generated inside Blender and are fully customizable—I can get a wide variety of effects. I may also use bump or normal maps to give the texture an extra layer of realism by simulating surface details such as wrinkles, bumps, or scratches without affecting the geometry of the model.

To give this material some realism, I will just change its Roughness—how shiny or matte the surface presents itself—and Metallic for things like metal or glass. The specular value further influences how reflective the material is.

Lastly, I add lighting to make the textures pop out; usually, I use HDRI lighting for natural reflections and soft illumination. Having set everything, I render the scene with Cycles to have high-quality output that really shows the textures and materials. It takes a simple 3D model and makes it a very detailed, realistic object.

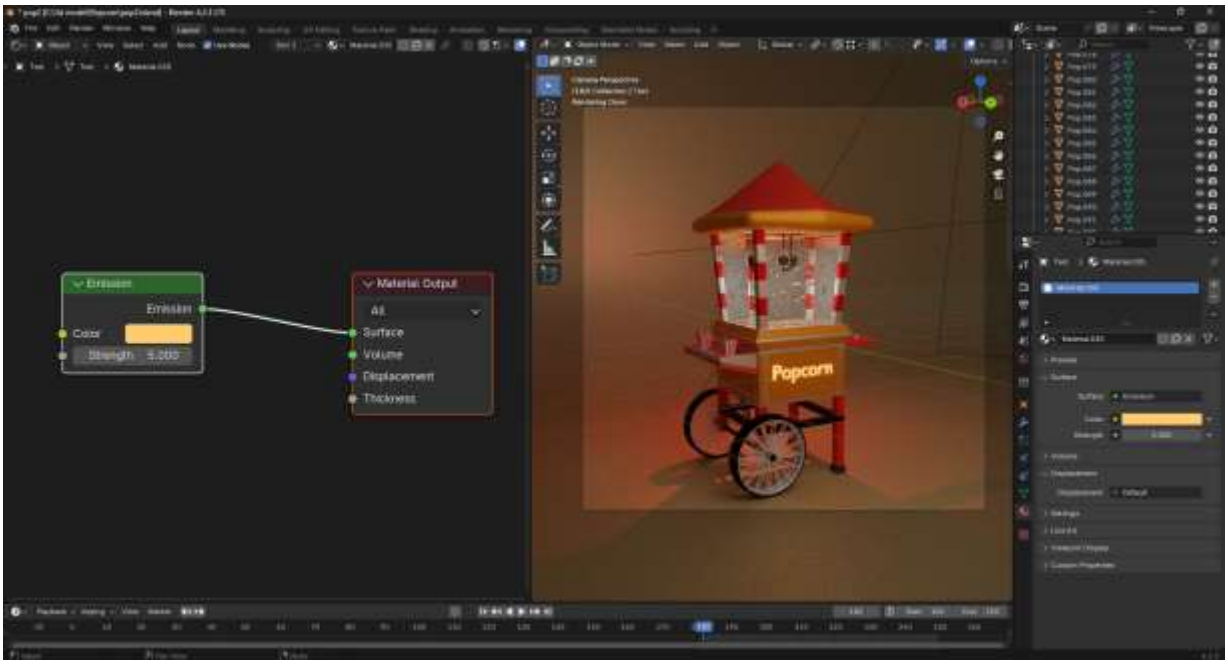

Figure 4.15.3: Texture of Popcorn Van

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

Figure 4.15.4: Final 3D Popcorn Van

4.16 House

My supervisor or team leader Nahidur Abedin, He's sent me to make a Traffic Item into a game asset. I took a reference from online. Here are my reference images

Figure 4.16.1: Reference of House

I started by blocking out the base form of the house using primitive geometric shapes. For the body of the house, I started with a cube and scaled it up in one direction to create a rectangular box that would represent the walls of the house. I then extruded the top face to create the roof, shaping it to slope by adjusting the edges. The roof itself was made from another cube scaled and rotated to create a pitched roof that fit the style of the house.

I did most of that with a combination of cubes and Boolean operations for the windows and doors. I created the rectangular shapes for the window frames and doors, then subtracted them from the

walls to make the openings. I modeled the window frames and door frames separately, extruding the smaller details like sills and panels to make them a bit more realistic.

Next on the list was detailing the exterior. I used the Subdivision Surface Modifier to smooth out the walls and roof, making the house appear less blocky. I also added smaller details like the chimney, modeled with a cylinder scaled and moved to sit atop the roof.

As for the materials of the house, I used a very basic setup in the Shader Editor. I assigned a brick or wood texture to the walls by plugging an Image Texture node into the Principled BSDF shader. The roof got its texture with tiles, adding some more details with a repeating image pattern. For the windows, I used a glass shader with a bit of reflection on the surface to make them more realistic.

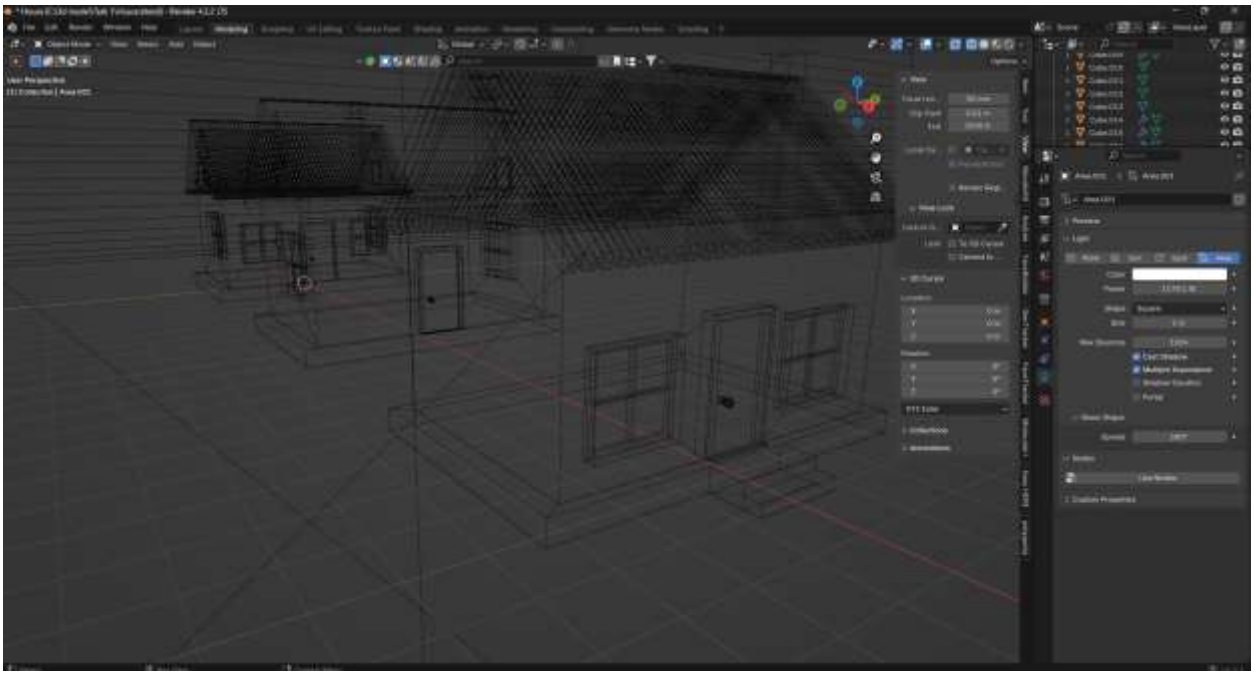

Figure 4.16.2: Wireframe of House

Texturing in Blender means giving a 3D model a variety of materials and surface details to make it look richer and more realistic. Here is a simplified explanation of the process:

First of all, UV unwrapping is done. This is the process of flattening a 3D model's surface into a 2D plane so that textures can be applied to it properly. I select the object in Edit Mode and use the Unwrap option to create a UV map, which acts as a guide for how textures are applied to the model's surface.

First of all, right after unwrapping, I jump into the Shader Editor to create the materials. The Principled BSDF shader is the base shader I use, since it gives a realistic starting point for most materials. It allows me to tweak things like base color, roughness, metallic properties, and so on. I can then apply image textures, like a picture of a brick or wood surface, by connecting an Image Texture node to the Base Color input of the shader. This allows the model to take on realistic surface textures.

I also use procedural textures, which are created directly within Blender. These textures, such as noise or wave patterns, are useful for adding complexity without needing an external image file. They can be used to create details like dirt, rust, or even stylized effects.

For more realism, I will often use bump maps or normal maps. These maps simulate surface detail, like scratches or wrinkles, without actually adding more geometry. They create the illusion of depth on a flat surface, making the object appear more detailed than it actually is.

Lastly, lighting greatly influences how textures will look. I therefore use HDRI lighting to give me natural reflections and soft illumination of the subject. Having set up everything, the scene is now rendered through Cycles to display a photorealistic result, which best shows how the textures and materials should appear.

The outcome of this unwrapping and applying of textures, refining of materials, and setting up of lighting gives me models that are very much lifelike and visually attractive.

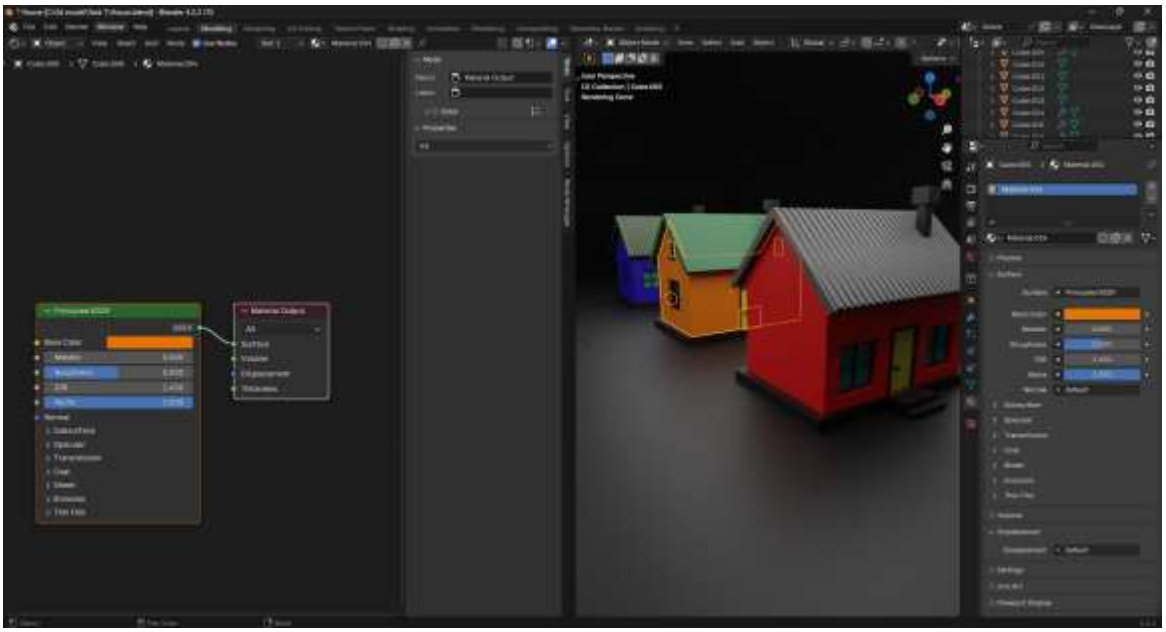

Figure 4.16.3: Texture of House

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

Figure 4.16.4: Final 3D House

4.17 Low Poly City

In this project assign to me my supervisor or team leader Nahidur Abedin, He's sent me to make a hummer into a game asset. I took a reference from online. Here are my reference images.

Figure 4.17.1: Reference of Low Poly City

Creating a low-poly city in Blender, I started by focusing on simplicity and then went to the geometrical shapes that mark the low-poly style. First of all, I needed to establish the layout of this city. I used basic cubes and rectangles for creating the big structures of buildings, streets, and roads. Basic shapes were scaled and placed to form an orderly grid, giving a clean, well-structured look to the city.

Then I could proceed with the details of separate building modeling. During work, for the low-poly style, I did not complicate the shapes using cubes and rectangle extrusions to form a base for each house. I stayed away from heavy detailing but kept the simple, blocky forms clear in order to

indicate that it's a building. I made slight variation in height and shape for visual interest among these houses, but keeping the low-poly feel intact.

Then I added additional details like roads, sidewalks, and parks in the same way. For making the roads, I was just creating long flat cubes and placed them between the houses, trying to save the overall structure of a city. I made trees and streetlights with basic cylindrical shapes: trees were simple cones or spheres atop a cylinder trunk, whereas streetlights had a little cone at the top.

I did minimal texturing to keep in line with the low-poly style, using flat, solid colors and simple gradients applied to buildings, roads, and other objects. That helped me keep the stylized blocky look without getting too detailed. Texturing was done in Blender's Shader Editor, making use of Principled BSDF shaders with basic color inputs and slight roughness to give the materials a subtle variation in appearance.

I did it by adding some simple background elements to bring the city into life, such as a low-poly sky and terrain with planes that gave it some depth. Then I set up a basic camera angle that captured the city and rendered it in Cycles to make the lighting smooth and clean. The result was a vibrant, highly stylized low-poly city with a playful yet clean look to it, fitting for the genre.

The process has been to use minimal geometry and textures, paying attention to composition and layout so the city can feel alive without sacrificing the simplicity of low-poly design.

Figure 4.17.2: Wireframe of Low Poly City

In Blender, texturing was done with the aim of keeping a low-poly city and its essence intact. First, I had to unwrap 3D models of buildings, roads, and other objects. This is a process of flattening 3D surfaces into 2D planes to apply the textures without distortion. Since flat solid colors were needed for texturing, unwrapping was not detailed but was kept as simple as possible.

I created the materials for each object using the Shader Editor. The Principled BSDF shader was used to define the basic properties of the materials, focusing mainly on Base Color adjustments. The buildings were assigned flat colors-beige or gray for concrete and brick effects-while roads were given darker shades to simulate asphalt. Trees and other smaller objects were textured bright, solid colors that fit within the stylized look of the city.

Instead of going into detailed image textures or complex normal maps, I relied on procedural textures where needed, like a simple green texture for grassy areas. This helps maintain the minimalist style while slight variation is introduced. I kept the surfaces flat and smooth on purpose to avoid intricate details, which are not typically seen in low-poly design.

HDRI lighting for soft, natural light to enhance the colors without overly complicated shadows or reflections was used.

With the camera and composition set, I rendered it in Cycles to get a clean, vibrant low-poly city which would be visually engaging yet still true to the simple, geometric design.

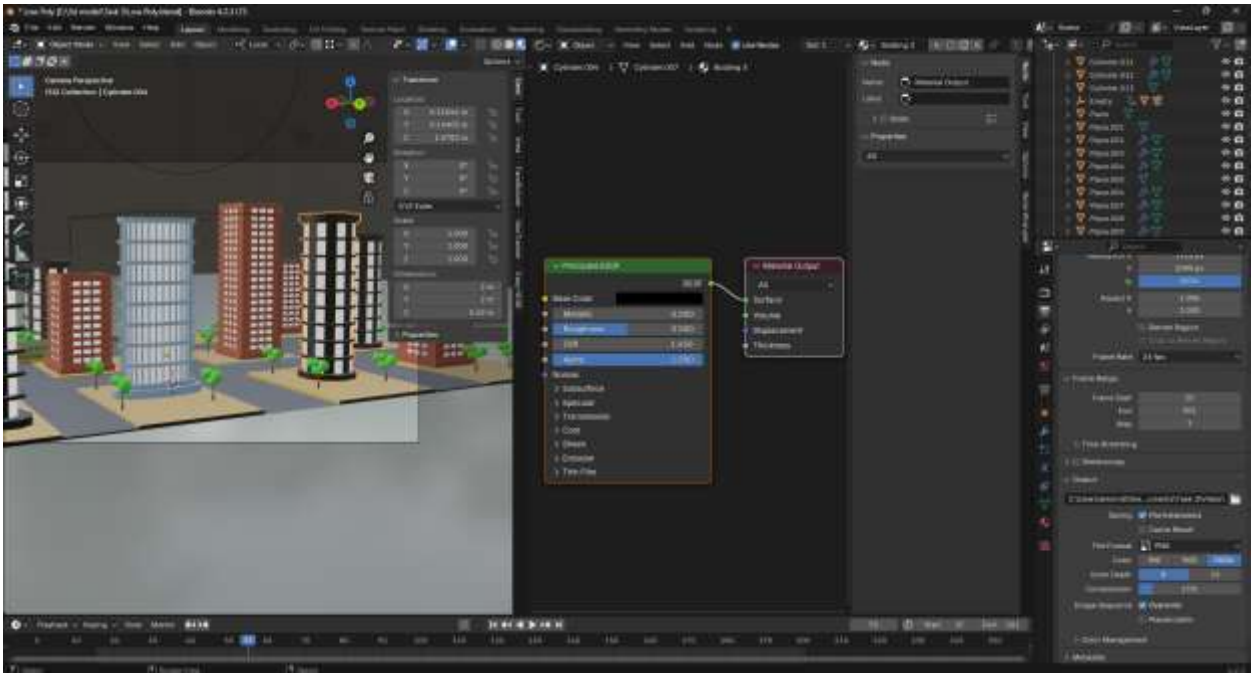

Figure 4.17.3: Texture of Low Poly City

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

Figure 4.17.3: Final Low Poly City

CHAPTER 5
Discussion of my internship

Starting with the internship, I took the initiative of creating 3D clothes and embarked on an adventure in this industry. For each assignment I started, I carefully looked at the reference images and arranged the collection that was to be painted with additives cautiously. Hard and instructive, modeling then pointed out a few mistakes that took quite some work to rebuild. Correcting those mistakes became an important part of my learning curve. Moreover, achieving accuracy in texturing each version to match the given reference picture added to the overall time-consuming yet rewarding experience. The modeling section presented issues, most of them regarding poor clarity in some reference pictures, and, therefore, was complicated and stressful. While great powerful features of Blender sometimes brought about the creation of many huge version files, this led to some time-consuming setbacks. In reflecting on my studies, I have also come to note similar scenarios where there was too much extra labor record, which also led to a waste of time. Turning in frequent progress reports to my manager provided valuable feedback along the way to the weekly meetings. These conversations have also provided me with very detailed information about the tasks at hand, which has helped me perform them correctly. My manager was very happy and satisfied, again underscoring the excellence in my performance. As an intern, my key tasks were outfit 3-D creation, which also gave me great learning reports/information. I encountered a lot of challenges; mistakes were made, and from these also, I learned a lot. Thorough planning became critical before commencing with any model; hence, it was mandatory to study in-depth reference images. Starting additives required defining a step-by-step sequence for adopting a methodical approach. The section of modeling took quite long since correction of errors took time on account of mission complexity and various mistakes committed during the technique. More important is the fact that texturing each version to match up with the reference photograph requires accuracy in the texturing itself, which adds on extra time to the normal approach. The modeling method given the few photographs from the references was not clear, presented some rough challenges, and it was indeed a really hard and puzzling task. Blender is a very powerful tool, though it may get cumbersome once several model files are in use; this adds to the weight of the program. I have been in such a situation, and this often meant many work documents and wasted time. My management got used to progress reports periodically, and these were able to help them

in providing constructive criticism after reviewing each project. Following instructions from my supervisor, in time I completed assignments and got positive feedback, enjoying my work. My internship began with the making of three-dimensional models, which, though there were several mistakes in those, gave very important feedback while studying. Just before going into detailed work over version layout, solid planning shall be done with visualization. The system was such that the separation of male and female components would be done on the move, piece by piece, until informed decisions could be taken. An interdependent approach thus facilitated modeling in a greener yet stronger way. I didn't rush while planning and making decisions in every aspect, due to which sometimes construction of particular models was very late. Making mistakes became the main frequent reason for changing the fashions that needed a long correction process. Also, special texturing methods were necessary based on the reference images acquired. To do this, I studied every picture carefully. Not every image was presented clearly, and it was tough to model it. For instance, creating multiple designs with commanding software such as Blender was challenging with numerous documents involved; overall, the speed was compromised. On the other hand, I had the same feelings because having many files and performance issues took further effort and time in sorting out. Lastly, I mailed my management on a weekly basis updates and requested particular feedback on whether I was meeting their objectives. Their complimentary comments about my paintings brought pride to my face.

CHAPTER 6
Conclusion

I had the amazing hazard to paintings with a number of specialists throughout my 3d modeling and visualization internship, which improved my information in the vicinity. Through this revel in, I become able to explore several 3-d applications and enhance my capacity to create 3D models both effectively and attractively. I also found out approximately some super 3-d texturing, modeling, and rendering techniques. Taking on big initiatives for essential customers gave me actual-global enjoy and taught me the way to paintings well with different groups and control my time well whilst developing and generating models. Even if there had been problems, I overcame them and received self-belief in my capacity to finish any work concerning the advent and rendering of three-D models. I am grateful for the way organizations like DYNAMCFLOW have helped to popularize 3-d modeling and enhancing, and I'm venerated to have contributed to turning in nice outcomes in my assignments at DYNAMICFLOW.

CHAPTER 7

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