CS 148: Introduction to Computer Graphics Final Project

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1920 x 1080. 100 %.

Path Taken
Path 2 (Blender Cycles) was chosen for this scene.

Concept
The scene draws inspiration from Philip's home country combined with Avrum's passion for surfing and Pusheen. Uruguay is known for its majestic and romantic beaches and rolling waves.

In Uruguay, beaches are not only a tourist venue, but also a place of community for people from all walks of life. Almost all beaches in Uruguay are accompanied by *paradores* where people can enjoy a wonderful South American meal and drink *yerba mate*, a caffeine-rich infused drink made from soaking dried leaves of the plant *Ilex paraguariensis* in boiling water. Yerba mate is normally served in the iconic "mate gourd" along with tall, metal straws used for filtering the leaves. Uruguay's inclusive culture is embodied in this drink as it is customary for people who dine at the same table to drink yerba mate from the same mate gourd. Mate gourds are normally paired with thermos flasks for the boiled water.

Depicted in this scene is food that is authentic to the South American region, *empanadas*, fried pastries that are filled with either meat or chicken. Interestingly enough, empanadas are also very famous in Avrum's home country, Indonesia. They are, however, under a different dish name. In Indonesia, they are called "pastel". Here, we used the Indonesian version to draw from both our cultures.

When paired with empanadas and yerba mate, you're bound to fall in-love with Uruguay's beaches, regardless of whether you're going on a surfing trip or a romantic honeymoon, which is what this candle-lit, picturesque scene ultimately is trying to convey.

References
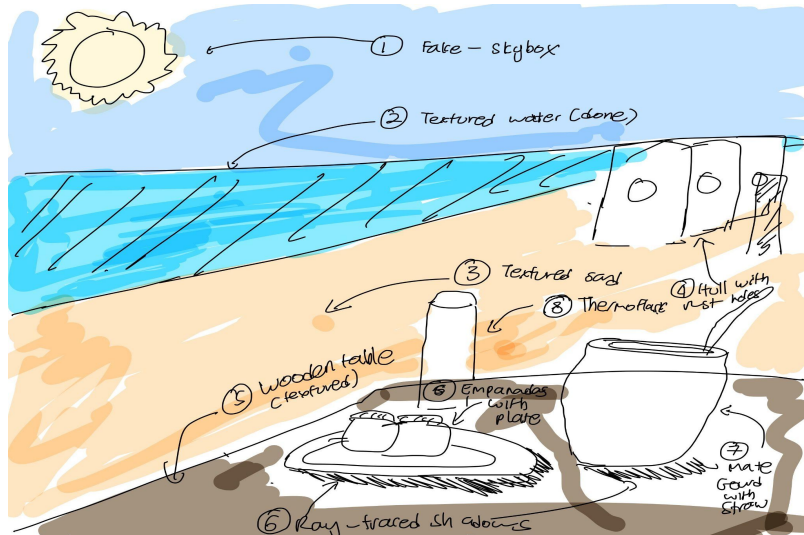
Avrum's initial sketch of the scene after listening to Philip reminisce and describe the beaches in Uruguay.

Inspiration from Philip's personal photography portfolio:

A mate gourd can be seen being shared by three people at a Uruguayan cafe.

Uruguay beaches are frequently dotted with rocky formations.

A Uruguayan sunset serves the inspiration for the lighting conditions of the scene.

Roles/Contributions
Avrum Noor was responsible for creating the candle light, sketching the scene, the beach and ocean environment, HDRI (skybox) setup, depth of field effect, texturing and shading the table, benches, surfboard, candle, flowers, empanadas, plates, and cutleries, as well as positioning of the camera.

Philip Pfeffer was responsible for proposing the scene, creating the thermos flask from scratch, texturing the mate gourd, composing the objects on the table, adding and texturing shells, adding the rocks, and modifying the water beach and depth of field to make the beach look more realistic. He also helped with the sun & environment lighting to create a more "romantic" scene.

Variant A

Variant B

Assets Imported Online
Mate: https://3dsky.org/3dmodels/show/mate

Yerba mate: https://www.hebrideanteastore.co.uk/product/mate-green/
Leather texture: https://www.poliigon.com/texture/fabric-leather-buffalo-rustic-001
Metal rim: https://www.poliigon.com/texture/rust-mixed-on-paint-012
Chair model: https://www.turbosquid.com/3d-models/3d-chair-model-1172145
HDRI Sky: https://polyhaven.com/a/umhlanga_sunrise
Wooden table:
https://www.turbosquid.com/3d-models/free-max-model-wooden-bench-table/884931
Pepsi can: https://www.turbosquid.com/3d-models/pepsi-new-design-3ds/546207#
Surfboard: https://free3d.com/3d-model/surfboard-v1--129410.html
Images of Pusheen and Stormy (The cats on the surfboard!): Claire Belton
(https://pusheen.com/)
Thermos: Custom made.
Leather texture: https://3dsky.org/3dmodels/show/mate
Beach Rock: https://www.poliigon.com/model/rock-beach-small-002
Shells: https://3dsky.org/3dmodels/show/morskiie_rakushki_v_vazie
Utensils: https://www.turbosquid.com/3d-models/set-cutlery-model-1687795
Plates: https://www.turbosquid.com/3d-models/blender-fbx-free/1028759
Empanadas: https://www.turbosquid.com/3d-models/evening-snacks-samosa-3d-1787819
Candle: https://www.turbosquid.com/3d-models/3d-candle-glass-model-1374191
Candle flame: https://www.kindpng.com/free/candle-flame/
Flower vase: https://www.turbosquid.com/3d-models/flower-vase-3d-1567885

Assets Created
We made the thermos flask, ocean, candle flame, and sand ourselves in Blender. We also made the texture maps of most of the objects ourselves using Adobe Photoshop and modified them into the objects using the Shader Editor.

Project Requirements
We fulfilled the requirement of making a main geometry from scratch by making our own thermos flask, ocean, candle flame, and sand. For the UV mapping and texturing from scratch, we UV-unwrapped a surfboard and used Photoshop to create a texture map that gives the impression that the surfboard is custom-built. For the procedural material requirement, we used texture nodes for the sand, ocean, table, the rusted metal and leather of the mate gourd, as well as the leather of the flask. We also used the depth of field feature from the Cycles render for the Cycles feature requirement.

We spoke to our TA, Kevin Li, who he said our scene fulfilled the requirements because we heavily modified the textures, normal maps, displacement maps; created many textures ourselves from scratch, and created the thermos flask ourselves from scratch.

Document/Video Referenced
Ocean: https://www.youtube.com/watch?v=8sOJM6WctZA&t=6s&ab_channel=CGbird

Wooden texture:
https://www.youtube.com/watch?v=J9EhwL0F8nI&t=152s&ab_channel=TutsByKai

Beach Sand: https://www.youtube.com/watch?v=je8C03Yoc8A&ab_channel=TobyRawal

Techniques Used

1. Ocean:

   To make the water, we initially used a plane and subdivided it. We then added the ocean modifier to the plane. We used light blue as the base color and we changed the roughness value so the water can scatter light as well as the specular and metallic properties so that the ocean fits into our scene better.

2. Candle Flame:

   To create the candle flame, we took a picture of a candle flame and removed the white background in Photoshop. Then, we added a plane into the top of the candle and shaded it using the image texture node. The image texture node used the color from our candle flame image, which was then connected to an emission node and a transparent BSDF node to transform the plane into a 2D-flame. To make the flame appear more realistic, we duplicated the plane and rotated it 90 degrees, creating two intersecting candle flames. The following technique has frequently been used in video games, such as Minecraft (see below).

   A "3D" grass in Minecraft. Image taken from:
   https://minecraft.fandom.com/wiki/Grass

3. Wooden Texture:

   To create the wooden texture, we created a texture map node and used an image of a wooden plank as the basis color. Then to create the variations in texture, we added a noise node to the height of the texture as well as added the Musgrave texture node. Sometimes, to make the wood appear older with brown rings, such as that of the benches facing the ocean in our scene, we used a Voronoi texture node.

4. Sand:

   For the sand, we used a plane. We created a bump node and added noise to the height of the Principled BSDF node to create the sandy bumps that occur when grains of sand are piled together. We also increased the roughness of the plane so the grains of the sand are more prominent. To make the sand surface more uneven and have a "wave-like" appearance, we used a wave texture node as well.

5. Surfboards:
   To make the texture of the surfboards, we UV-unwrapped the surfboard object and mapped its edges. We use its edge mapping to create an image template for its surface. Then in Photoshop, we added a colorful gradient and pasted an image of our favorite cartoon cats and used that image within an image texture node to wrap the pictures of the cats around the surfboards.

6. Thermos flask:
   The thermos flask was made from a cylinder, with loop cuts and extrusion used to distinguish the cap from the body. A bevel was used on those cuts and on the top of the cap to give it a curved shape. Smooth shading and reflective (non-rough), metallic texturing was used to make it shiny. The traditional decorative leather cladding was made with cylinders concentric on the metal body with a leather texture applied. Vector points were used to make the leather image texture and corresponding normal map repeat and scale appropriately.

Depth of Field Settings
Focal Length: 50mm
F-Stop: 10
Focus: Candle

Technical Contributions
None