

CS148 Final Project Report

Poet sunrise sail - water ink painting style

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Project Requirement

1. Leveraging the power of ray tracing
 - a. Water materials to cause reflection and transmission
 - b. Color bleeding effect
 - c. Transparency in flower petals
 - d. Volumetric fog
2. Main geometry from scratch
 - a. Temple: The temple was made of basic meshes (i.e. plane, cube, circle, and cylinders), utilizing Bevel, Loop Cut, Extrusion, Inset in the Edit Mode. We used the array modifier to achieve symmetry for both the “bone” structure and the roof. The roof is built by connecting arrays of cylinders with curved planes (molded using Proportional Editing) and is cut to fit within the beams using Boolean Modifier. The roof and the chairs are stretched and reshaped using Lattices to achieve a more fluid, realistic shape. The ornaments between the pillars are built from applying a Skin Modifier onto a hand-drawn 2D geometry. In addition, the base and the stairs are also made from extruding from 2D geometries and smoothed using Bevel and Loop Cut.
 - b. Poet + fisherman on a bamboo raft: The human figure is made of skin modifier and rigid body feature. By moving bones, different poses can be created from the same mesh object. Water ink style painting styled textures are applied on the outfit, which is a loose robe that ancient poets usually wear.
 - c. Background mountains: modeling utilizes cloud displace modifier. Shading materials followed tutorial, and also considering distant mountain coloring effect
 - d. Blossom tree: flower petal is made with array modifier; tree trunk is generated by blender add-on sampling tree
3. UV mapping and texturing from scratch
 - a. Circular end caps on the temple’s roof uses UV mapping

- i. The end cap on the temple's roof is mapped to the image of the Japanese Kawara roof's end cap in order to add realistic details to the temple model.
- b. The grasslands uses UV mapping
 - i. The grasslands are UV mapped to a Chinese ink and color painting. The painting provides a rich set of colors with smooth gradient and low saturation that helps the grass converge with the artistic, painting-like style of the scene.
- c. Roof tiles and pillars use material nodes
 - i. We applied an asphalt texture to the roof tile. The custom material node uses the Color channel of the base color, roughness, normal, and displacement image textures to apply to corresponding channels in the Principled BSDF node.
 - ii. The pillars used two textures: a Principled BSDF node that simulates a rough red earth texture as the base, and an Emission texture to draw the outlines. The Principled BSDF is done similar to the roof tiles, combining base color, metallic, roughness, and normal image textures. The emission texture is done by connecting a Fresnel layer weight to a Color Ramp converter. This provides the illusion that the temple is outlined and drawn by an ink brush, which echoes the main artistic style of the scene.

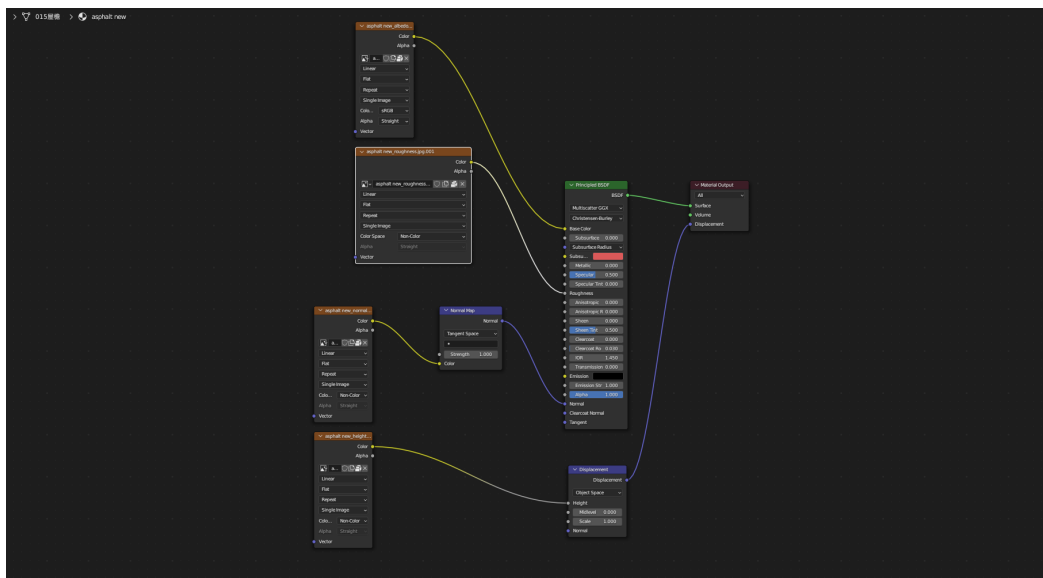


Figure 1. Material nodes used to create the roof tiles

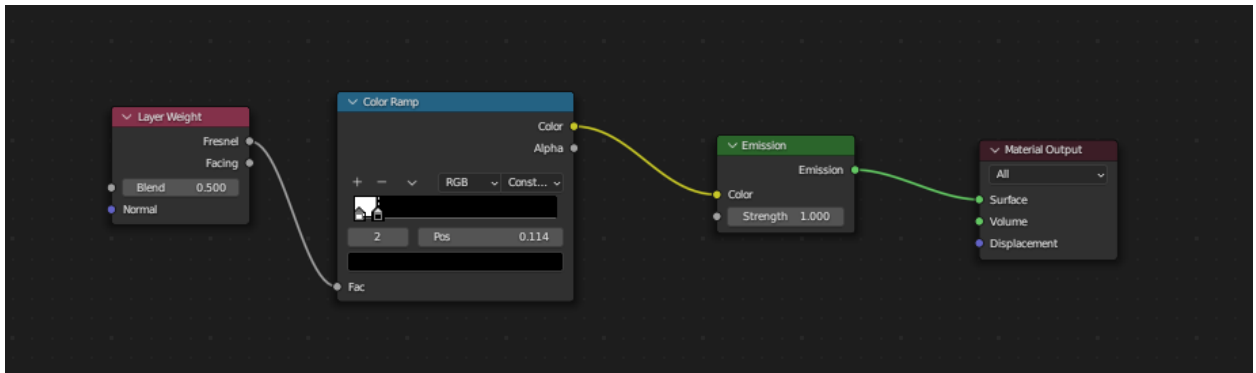
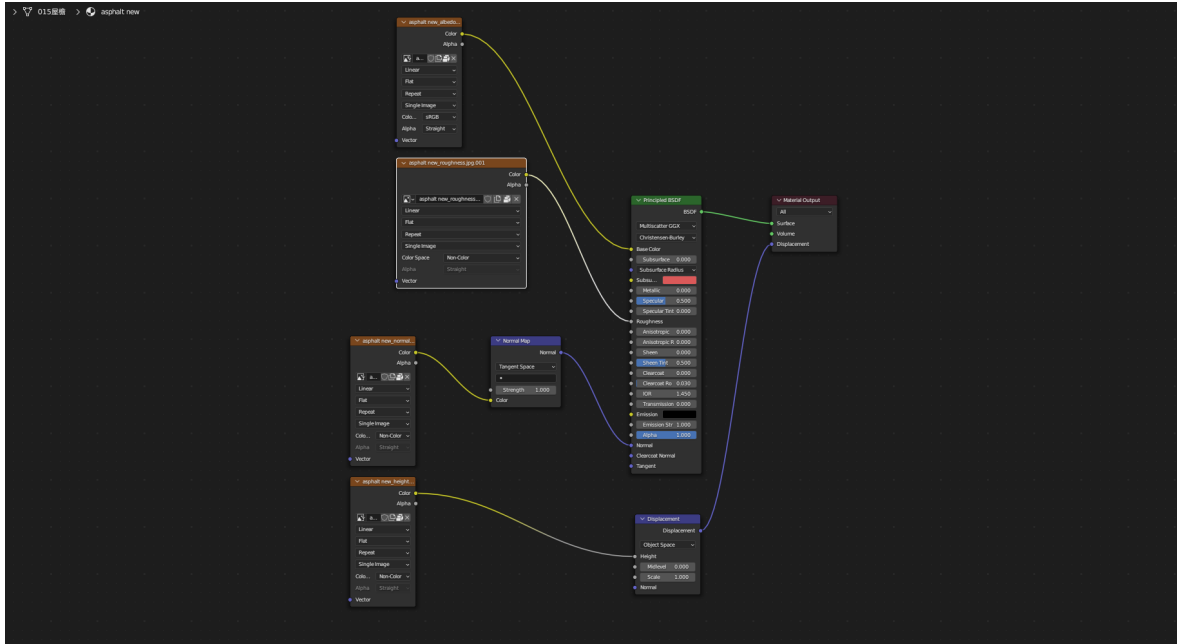


Figure 2. Material nodes used to create the pillars

4. Blender/Cycles feature

a. Volumetric fog in background mountains

- i. We used a principled volume node to apply a volumetric fog effect. This feature helps us to simulate a sunset scene, where the sunlight is largely absorbed by the fog and casts a very soft, dim lighting on the scene.

b. Particles system for grass

c. Cloud texture displace modifier to build mountains

Contribution

At the initial phase, we discussed and researched resources together for the project. During the progress, both have contributed to adjusting and tuning the scene towards the final image.

- Cynthia:
 - Temple + texture + UV mapping
 - Grassland
 - Volumetric fog
 - Far away birds
 - Rendering
 - Presentation
- Jing:
 - Background mountains + lake + sun
 - Poet + fisherman
 - Blossom tree + sparse tree/bush
 - World background
 - Demo video

External Sources

- Tree trunks are created with blender add-on ‘Sapling Tree Gen’ under Curve
- Island/ground are created with blender add-on ‘ANT landscape’
- Temple texture images are downloaded from [BlenderKit](#)
- Downloaded images:
 - Grass texture image source: ([link](#))
 - Tile texture image source: ([link](#))

Tutorials

Main inspiration

Special thanks to [aubiz](#) from bilibili. We followed many of his tutorials in learning how to build ink painting style scene in blender and developing our main geometries together with shader nodes

- [Mountains](#)
- [Poet](#)
- [Plant](#)

- [Temple](#)
- [Environment/sky](#)

Lake / Water

Referred to [this post](#) to utilize the advantage of a realistic water surface and cycles render engine in an ink painting.

Flower petals

Referred to [Blender Ink Wash Painting Style Scene Timelapse](#)

Grassland

Referred to [Blender 3.1 Tutorial | Making Realistic Grass With Particle System](#) to build the particle system.

Referred to [Tutorial: Ghibli/Breath of the wild Anime Stylized Grass in Blender \(C...](#) to apply an ink painting style to the grass texture.

Additional Reference

Please note that these mountain shader nodes are created by [audiz](#) and shared in his tutorials.

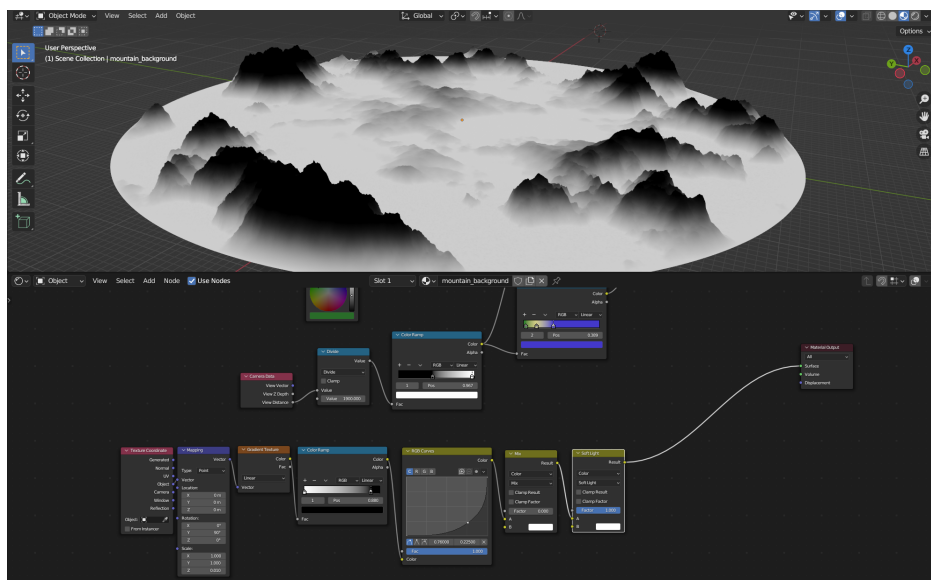


Figure 3. Mountains basic shading idea

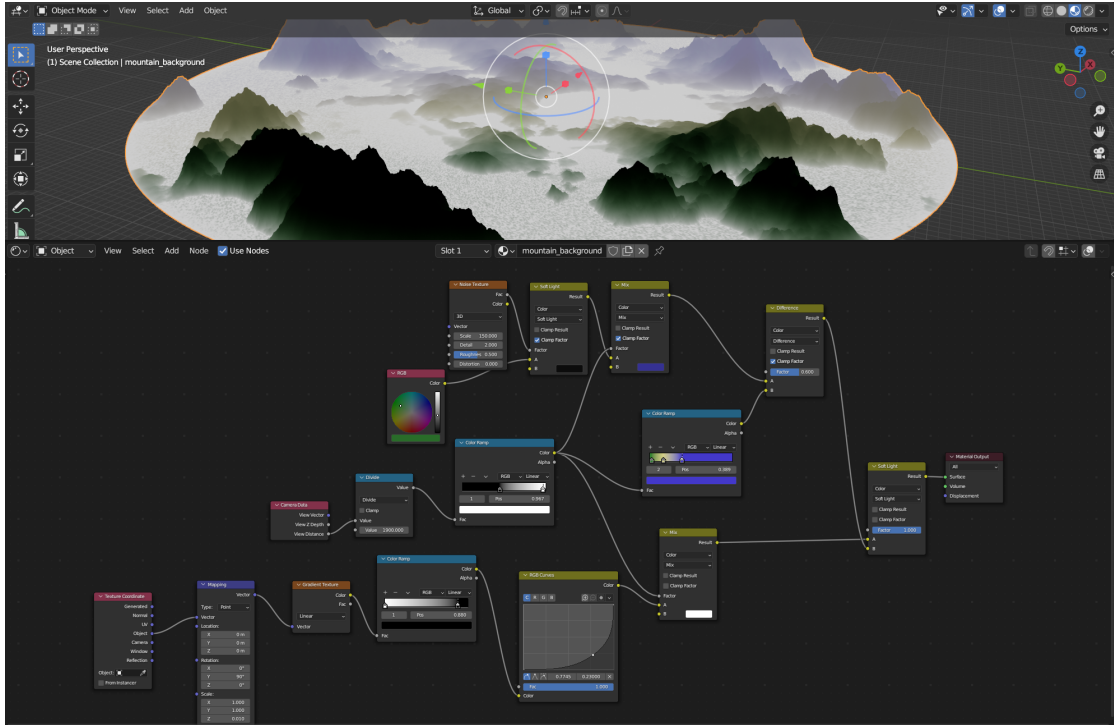


Figure 4. Mountains complete shader node ([distant mountain effect](#))

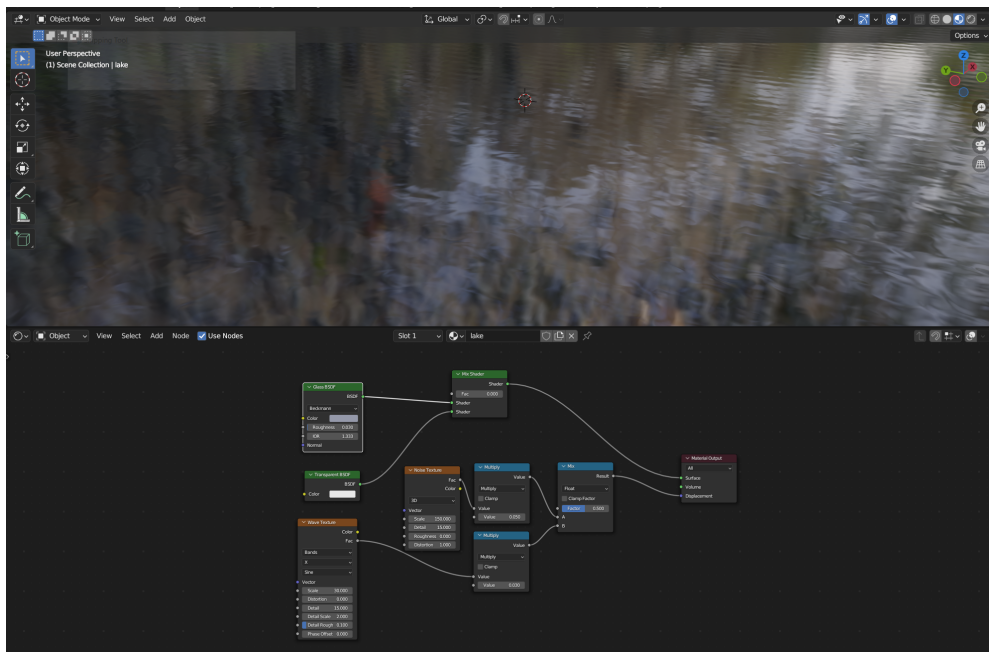


Figure 5. Water Texture Node

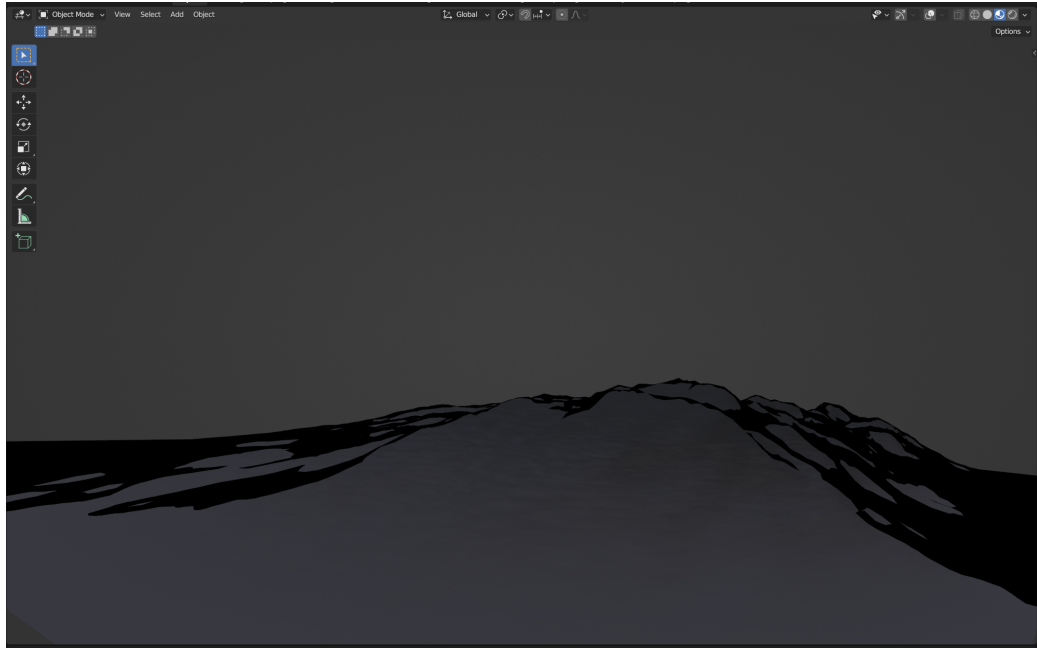


Figure 6. Island texture

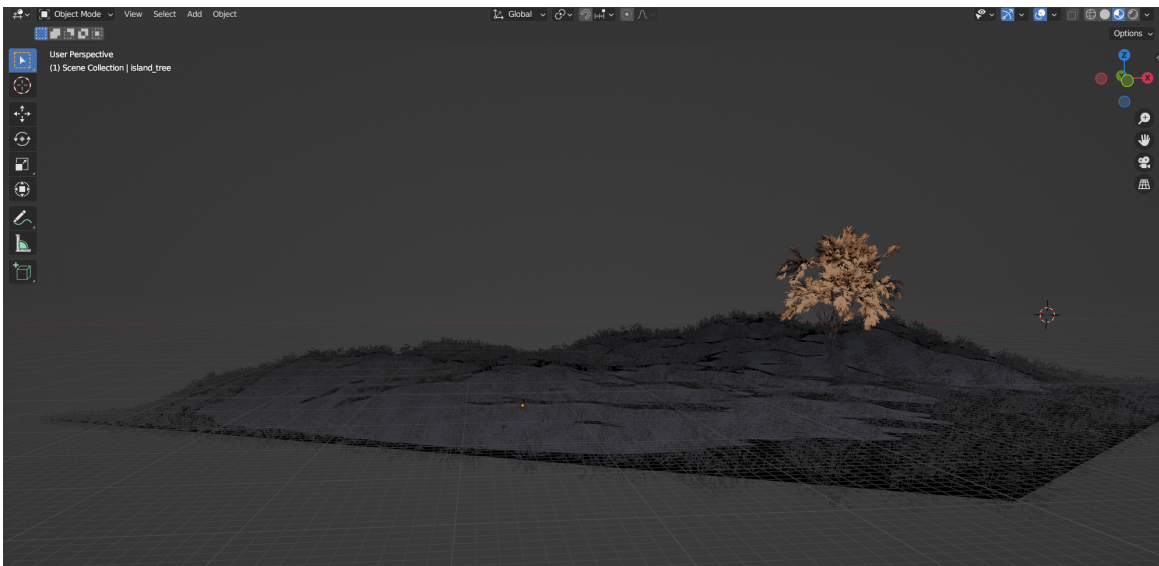


Figure 7. Island adding particle system

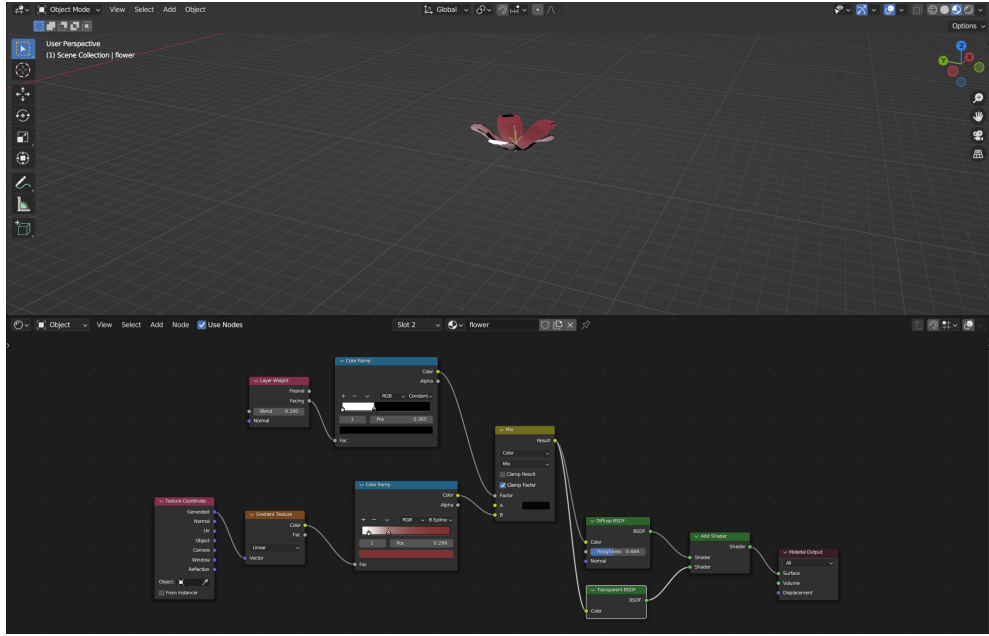


Figure 8. Flower petal made referencing [Blender Ink Wash Painting Style Scene Timelapse](#)

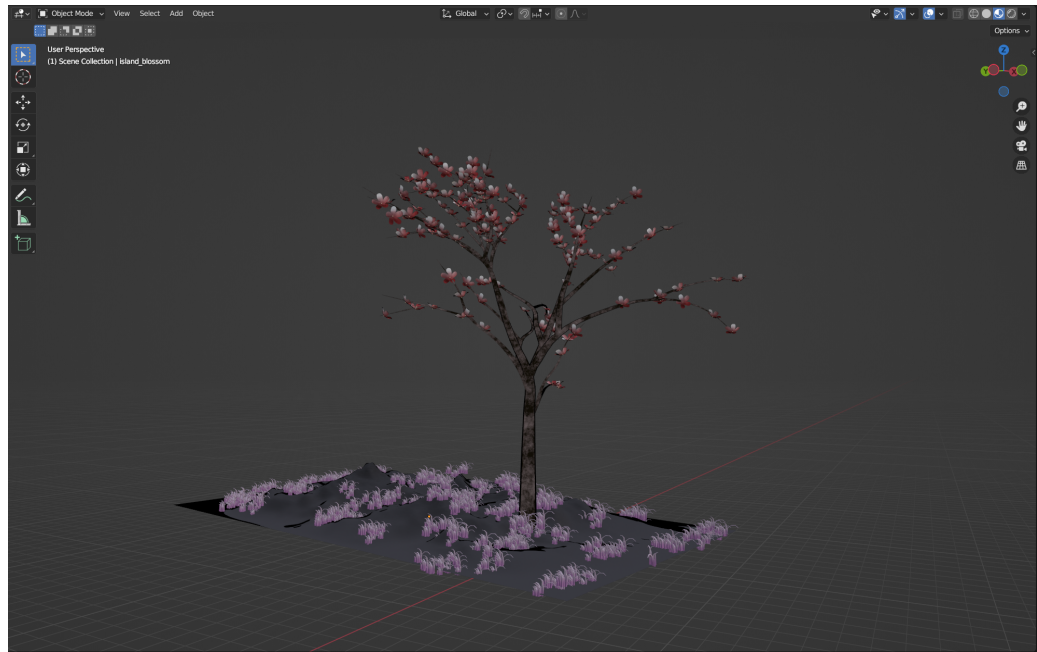


Figure 9. Blossom tree on a pink grassland

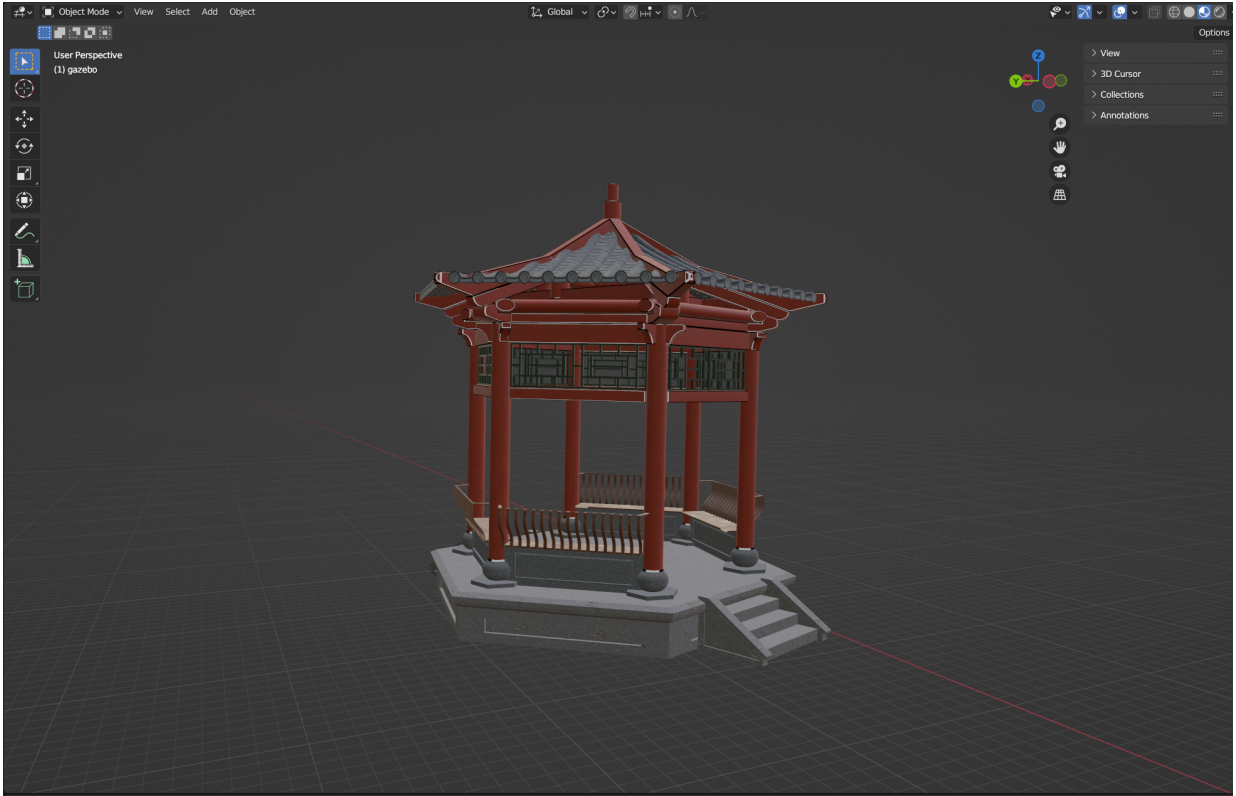


Figure 10. Temple object made from scratch