

# CS 148 Final Project Report

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## Goal

I wanted to create an image that highlights the beauty of nature. In the image I focused more on the natural elements (sky, clouds, water, trees) and tried to bring out the serenity of the environment in its natural state. I also wanted to evoke feelings of nostalgia, calmness and warmth for people seeing the image and attempted to do so by using more of an orange/yellowish tint for the light and background.

## Reference Image



## Contributions

I worked on this project by myself so I did all the work.

## Meeting Project Requirements

### 1. **Raytracing**

I wanted to utilize the water to showcase the aspects of ray tracing by having the water reflect the sky, the cherry blossom petals, the dock and the boat. I also wanted the pink color

from the cherry blossoms to influence the color of the surrounding scene, mixing with the sunlight and background color to achieve color bleeding that connects the entire scene together.

## 2. Main Geometry and Texturing

I modeled all the objects in the scene.

Object	Modeling Method	UV Mapping/Texturing
Water	Followed <a href="#">this tutorial</a> to model a plane to be like still lake water with bumps and reflection.	<i>Custom/Procedural Texturing</i>  [Refer to the section below for the node mapping]
Boat	Followed <a href="#">this tutorial</a> to model the boat.	<i>UV Mapped</i>  I UV unwrapped parts of the boat and applied <a href="#">this texture</a> .
Oars	Followed part of <a href="#">this video</a> to model the oars using a cylinder.	<i>UV Mapped</i>  I UV unwrapped the oars and applied <a href="#">this wood texture</a> .
Dock	Manually modeled the dock using basic shapes like cylinders and cubes while trying to roughly mimic the dock from the reference image.	<i>Custom/Procedural Texturing</i>  Procedurally created the wood textures used in the dock by following <a href="#">this tutorial</a> . For the different parts of the dock, I slightly changed the color of the wood using the same texture.  [Refer to the section below for the node mapping]
Mount Fuji	Used the ANT Landscape add-on to create a generic volcano and then used sculpting tools to manipulate the mesh to look more like Mount Fuji in the reference image.	<i>Imported Texture + Texture Paint</i>  Used <a href="#">this rock texture</a> from online to cover the mountain and then used the texture paint in Blender to paint the snow over this texture.
Petals	Followed <a href="#">this tutorial</a> to model the cherry blossom petals.	<i>UV Mapped</i>  I UV unwrapped the petal and applied the various maps (color, normal, displacement, alpha) from <a href="#">this online source</a> .
Trees	Followed <a href="#">this tutorial</a> to use the	<i>Procedural Texture</i>

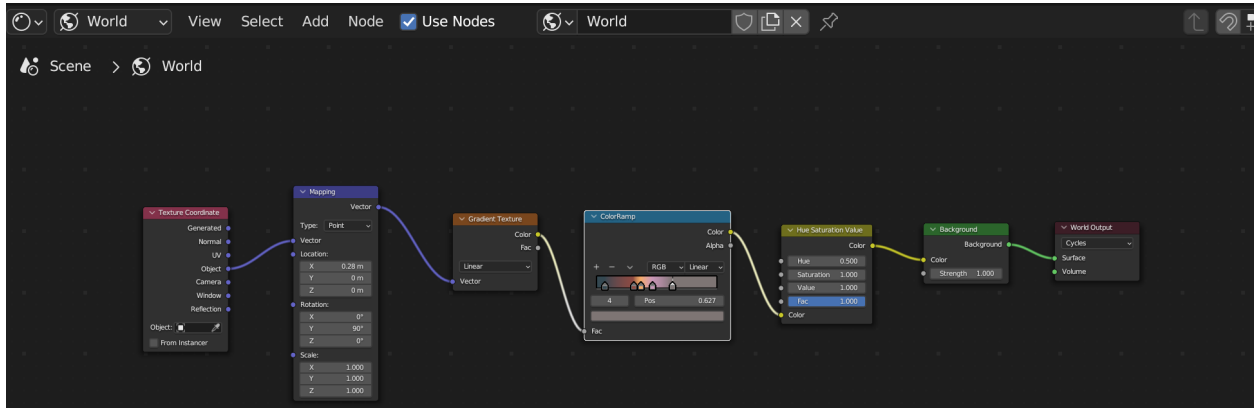
	petals/leaves I created to connect them to the trees (generated by sapling gen plugin) as hair particles.	Used a basic procedural texture with the default material properties to create the bark. I used PBR textures from <a href="#">this source</a> for the various types of green leaves.
Grass	Followed <a href="#">this tutorial</a> to use the particle system with hair to create the grass terrains.	<i>Procedural Texture</i>  Used a basic procedural texture with the default material properties to create the bark.
Falling Petals	Followed <a href="#">this tutorial</a> to animate the petals falling from the trees. Using the animation that is generated, I picked a frame where I liked the position of the petals and used those frames to create motion blur of the petals. I also set the water, boat, and dock as objects that the petals can collide with.	N/A
Sky/Background	Followed <a href="#">this blog</a> for creating a procedural sky in the world. I adjusted the colors of the gradient to match that of a sunset/sunrise.	N/A  [Refer to the section below for the node mapping]
Brick Wall	Scaled a cube to create a wall and then bent the wall to make it look curved.	<i>UV Mapped</i>  UV unwrapped the object and applied <a href="#">this brick texture from online</a> .
Clouds	Followed <a href="#">this tutorial</a> to create simple clouds using volumetrics. Then I overlapped multiple of these smaller clouds to create the bigger one used in the final picture.	N/A

### 3. Advanced Features

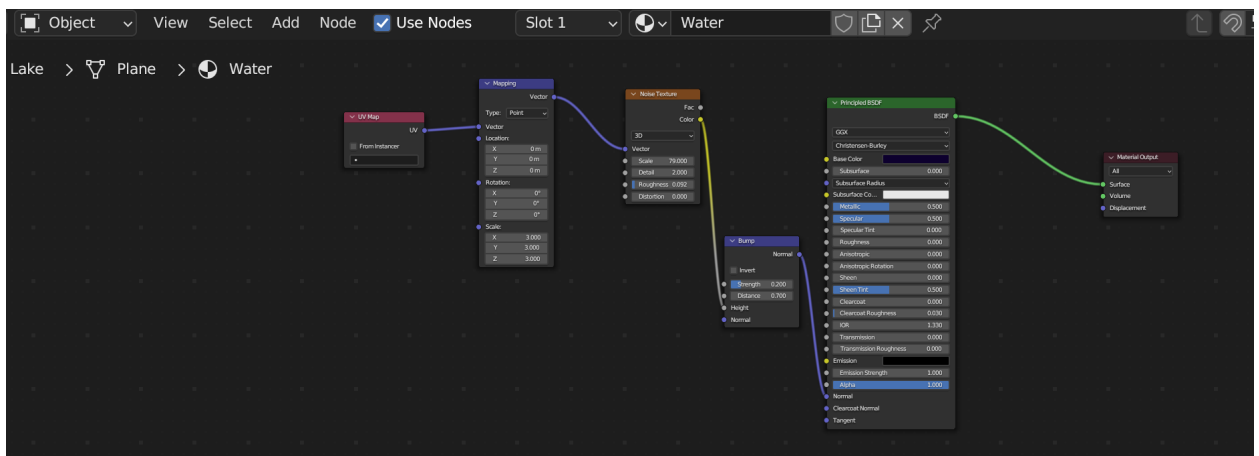
I used volumetrics to create the clouds, depth of field with an aperture of 3.0 to focus on the part of the image with the boat without making the background too blurry. I also used motion blur for the animation of the petals.

## Procedural Texture Maps

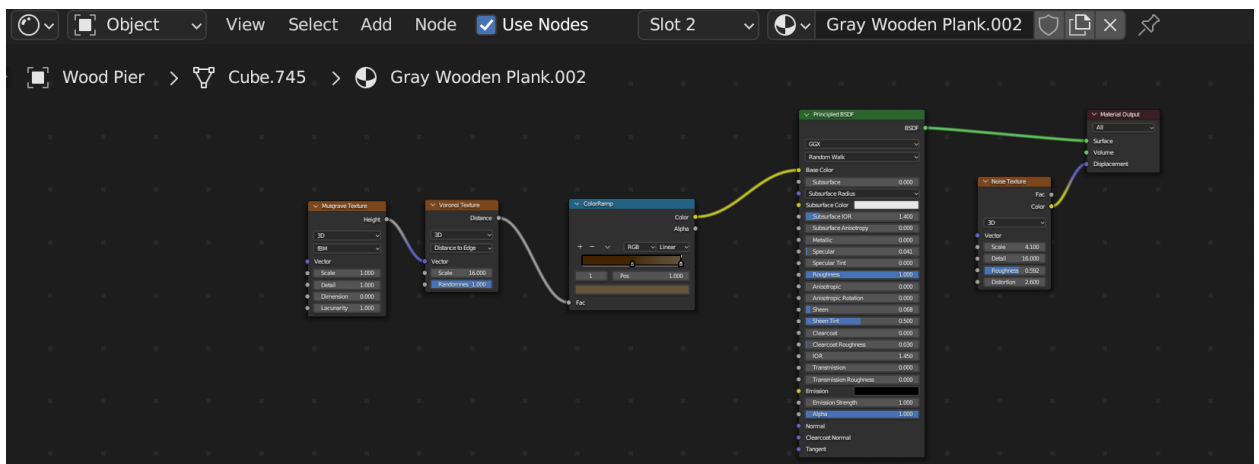
### 1. Sky/Background World Texture



## 2. Water Texture



## 3. Dock Wood Texture



## Tutorials Referenced

- Boat: <https://www.youtube.com/watch?v=jkXo3fHL67Q&t=113s>
- Oars: <https://www.youtube.com/watch?v=azRblGgQhjY> (only followed the part where they model the oars)
- Clouds: <https://www.youtube.com/watch?v=hxgDineKYrY>
- Sky: <https://www.polygonartists.com/create-procedural-sky-blender/>
- Grass: <https://www.youtube.com/watch?v=KWRL080X4vk>
- Petals: <https://www.youtube.com/watch?v=8QBLXRJTcQg>,  
[https://www.youtube.com/watch?v=8QBLXRJTcQg&ab\\_channel=OctopusEffects](https://www.youtube.com/watch?v=8QBLXRJTcQg&ab_channel=OctopusEffects)
- Brick wall texture: <https://ambientcg.com/view?id=Bricks076B>
- Dock Wood Texture:  
[https://www.youtube.com/watch?v=Kry\\_9dq3M4Y&ab\\_channel=GArtist](https://www.youtube.com/watch?v=Kry_9dq3M4Y&ab_channel=GArtist)
- Water: [https://www.youtube.com/watch?v=8m6oq\\_b9if0&ab\\_channel=Gokumon](https://www.youtube.com/watch?v=8m6oq_b9if0&ab_channel=Gokumon)

## **Assets Downloaded**

- Rock Texture for mountain: <https://ambientcg.com/view?id=Rock002>
- Boat Texture: <https://ambientcg.com/view?id=Planks030A>
- Oars Wood Texture: <https://ambientcg.com/view?id=Wood059>
- Petal Texture: <https://www.textures.com/download/3DAtlas0033/133343>
- Leaf Textures:  
<https://www.blender3darchitect.com/textures/9-free-leaf-pbr-textures-for-exteriors/>
- Brick Wall Texture: <https://ambientcg.com/view?id=Bricks076B>

## **Assets I made on my own**

- Dock - model and texture
- Mount Fuji - model and snow painting
- Boat - model
- Water - model and texture
- Brick Wall - model
- Grass Terrain - model
- Trees - model
- Cherry Blossom Petals - model
- Sky
- Clouds

## Variant with Different Sky



## Additional Notes/Challenges

Due to the limitations of the laptop I was using, I was unable to modify the scene while having all the trees, grass and other objects with hair particles present. This made tweaking the placement of trees difficult because I couldn't place it relative to the other trees in the scene. There's also an illusion of the petals floating on the tree branches, however when looking at it closer, there are twigs that the leaves are connected to but it's just hard to see when zoomed out. When trying to delete those "floating" leaves, the trees started to look bare so I ended up keeping some of the leaves that appear to be floating.