

# Submarine Rollercoaster in VR

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## Project Theme

We will implement a submarine rollercoaster ride in VR. The scene will be an undersea world with many sea lives, such as various kinds of fishes and plants, and possibly other interesting things like shipwreck and scattered treasures. The rider will sit inside a submarine that looks like Figure 1. The rider will be able to look around inside the submarine during the ride, but primarily look out the glass window.



Figure 1, An submarine example

If we have time, we may refine our 3D models or add on game features such as obstacles that the user have to avoid in order to move on.

## Resources for Implementation

Labs

Earlier projects

OpenGL/GLSL

3D models will be downloaded from the following websites(more will be added as we explore further into our project) :

1. TurboSquid: <https://www.turbosquid.com/>
2. Sketchfab: <https://sketchfab.com/>

We may build models using sketchup and 3ds max.

We will find an obj model parser library for our project to be able to load the models we created using external program.

## Technical Features Description

Not covered in assignments/labs:

- Move the camera in the scene along the rollercoaster path defined as a piecewise Bezier curve.
- Ambient occlusion for modeling objects in the scenery
- Collision detection (if made into a game)

Covered in assignments/labs:

- Glass, metal shaders for objects encountered along the ride (lab 10)
- Texture mapping (Ray)
- Sky box (lab 10)

## Job Division

Each of our team member will be taking the lead on one or two features as described below:

Yifan:

1. Ambient occlusion for modeling objects in the scenery
2. Creating a skybox and apply glass metal shader to objects

Jinglu:

1. Texture Mapping

Xinyue:

1. Bezier curve for rollercoaster path

The team will collaborate on creating and finding 3D models and textures, and loading those content into the scene.