Project 3a & 3b: PBS-IBL

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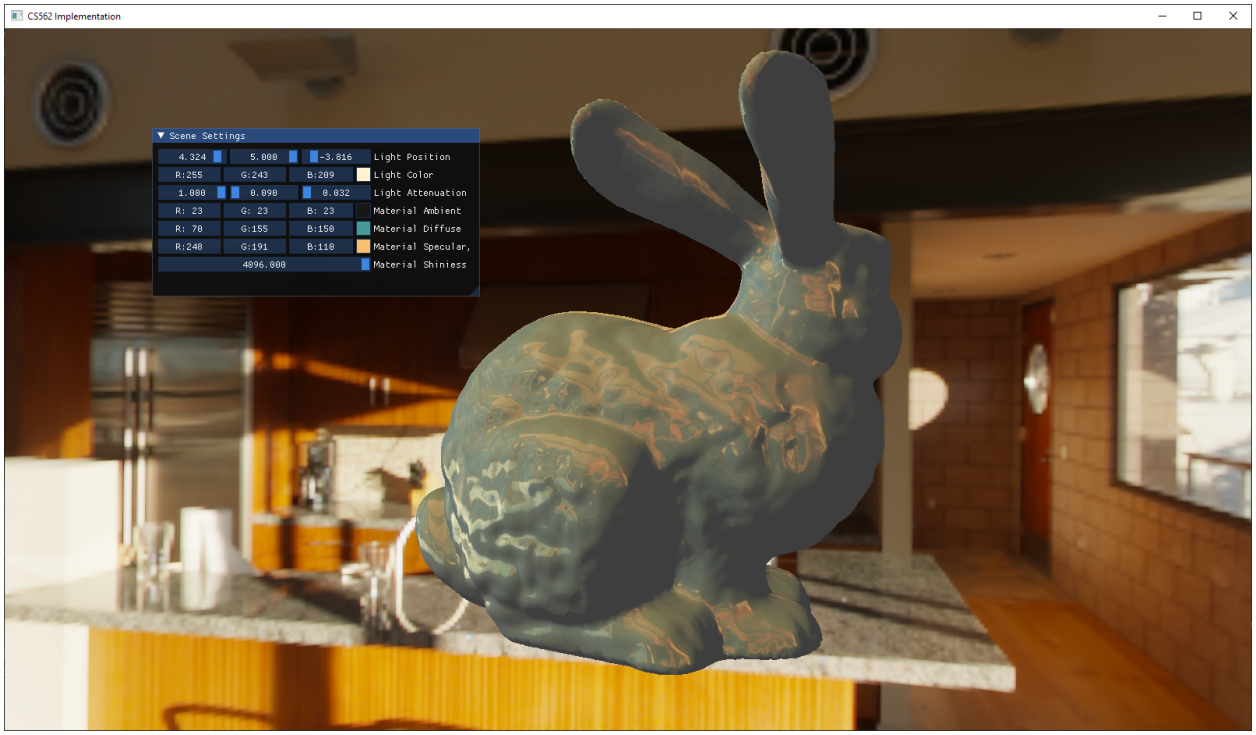
Project Outline

The goal of part a was to implement both physically based lighting and environment mapping, with some tone-mapping added on top. The goal for part b was to generate an irradiance map given an environment map.

Project Implementation

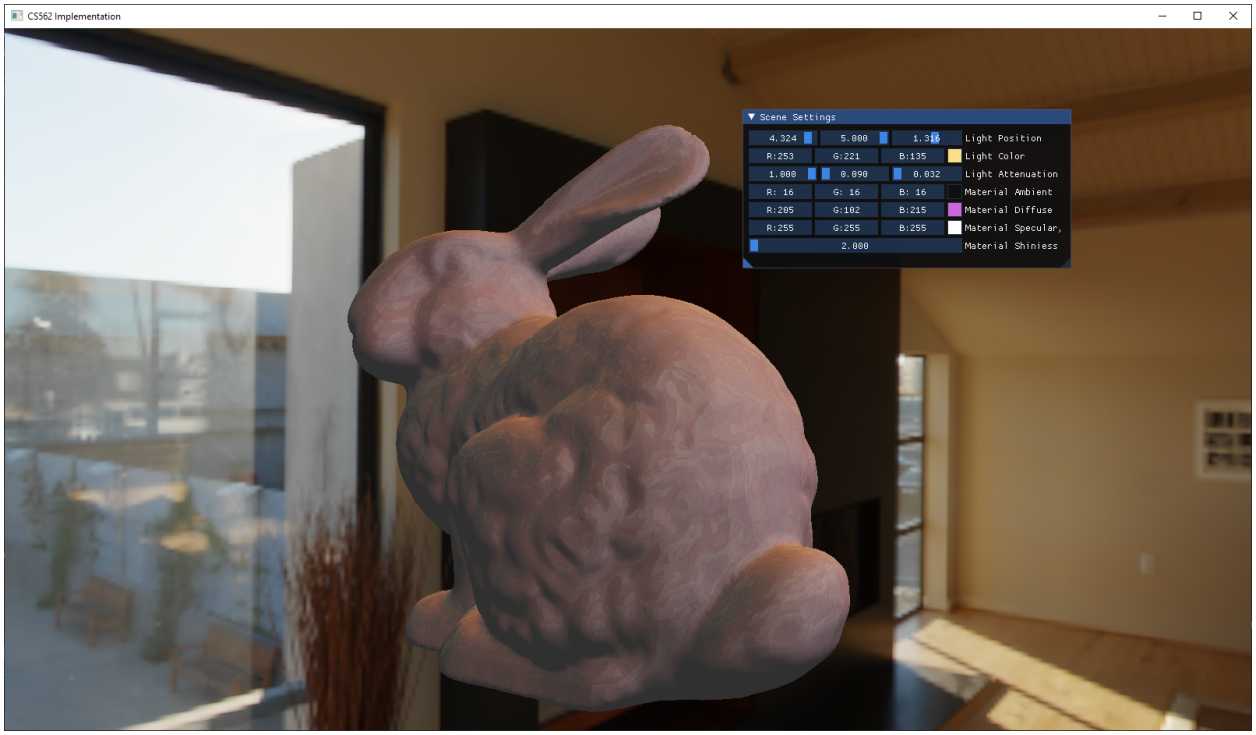
Please consult the index for specific locations of implementation details. The results were verified using ImGui as an interface, with RenderDoc on the side to double check that the correct operations were being applied. The implementations from previous projects were mostly left intact, aside from shadow mapping being disabled to showcase the current projects changes.



Project 3a Results

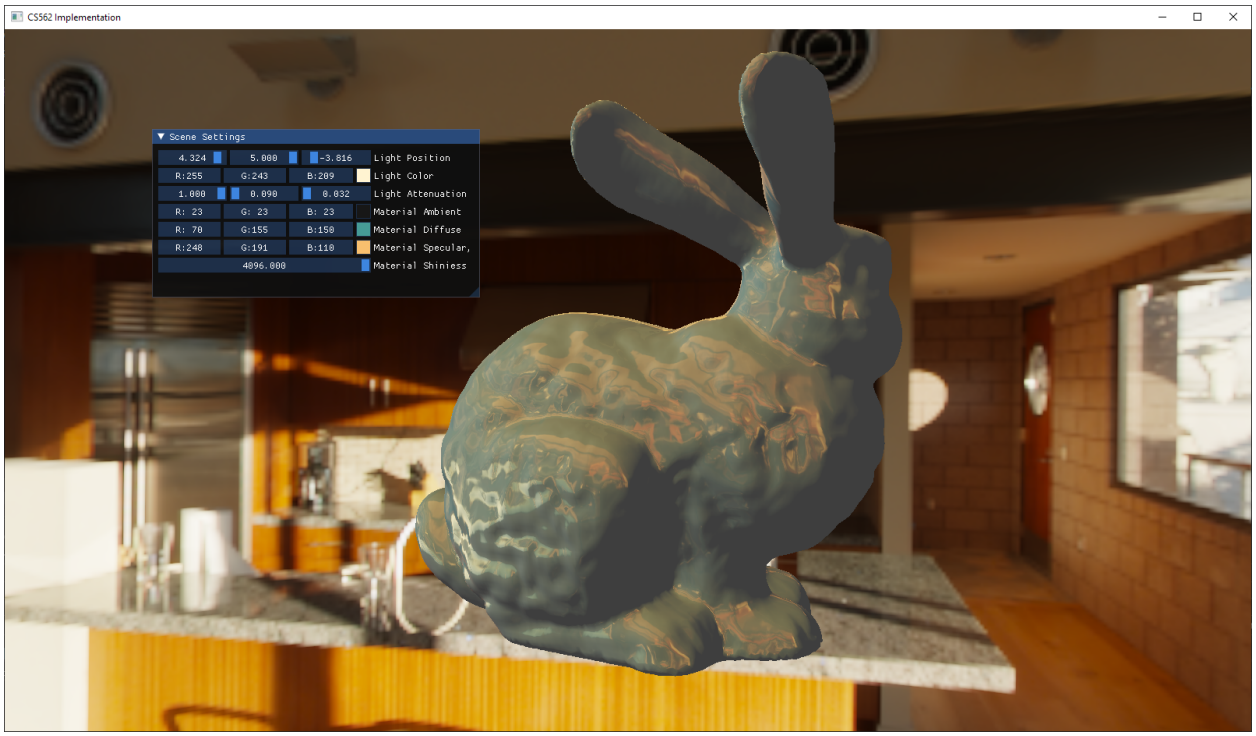
Here we have an example scene with a little bit of everything:

This is an example of a scene with very little specular reflection mixed in:



This is a scene with ONLY specular reflection and a high shininess applied:

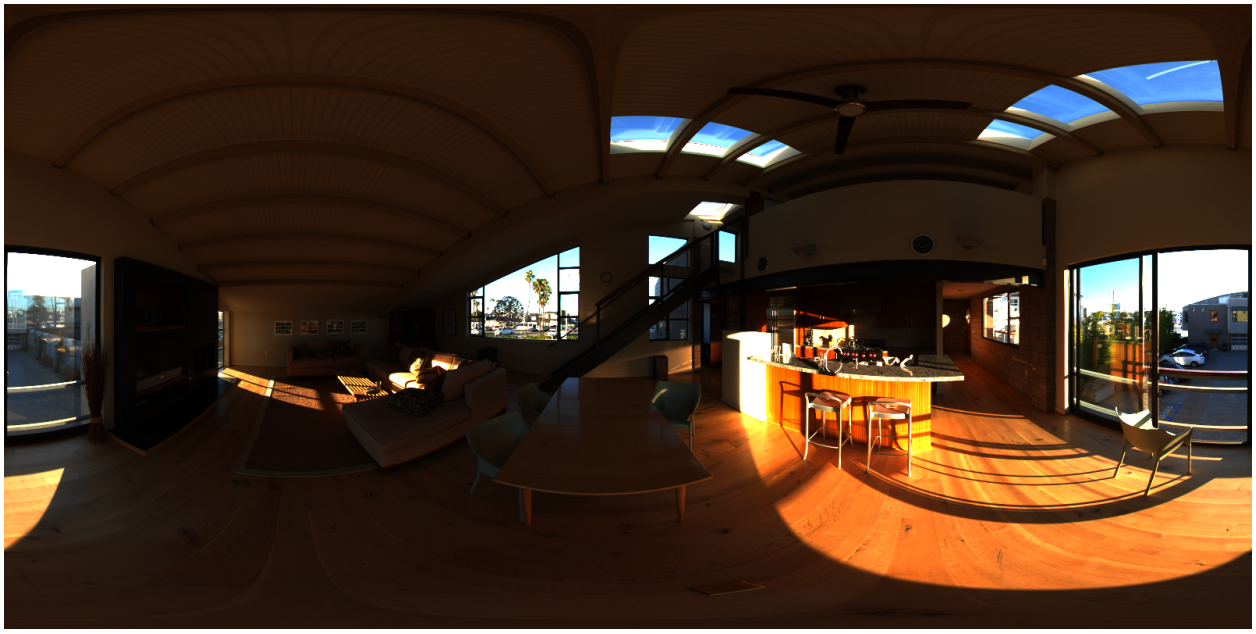
Here is another scene with a little bit of everything:



Project 3b Results

I used a given environment map as the input to the scene, and then used this to generate an irradiance map. The results can be found below.

Loaded environment map:



The generated Irradiance map (to scale):

Directory Index

All relevant source files can be found under **`./Project-3/Framework/Source/`**. All relevant shader files can be found under **`./Project-3/Content/Shaders/`**. Other external directories are used to compile and run the engine.

Relevant Files

PBS Lighting Calculations . . . . . **`Shaders/fsq.frag`**
Skydome shader . . . . . **`Shaders/skydome.*`**

Implementation

Scene Render Loop . . . . . **`Source/main.cpp`** *L239-L380*
GBuffer/PBS Passes . . . . . **`Source/main.cpp`** *L327-L351*
Generating Irradiance Map . . . . . **`Source/main.cpp`** *L399-L478*