CMPE 360

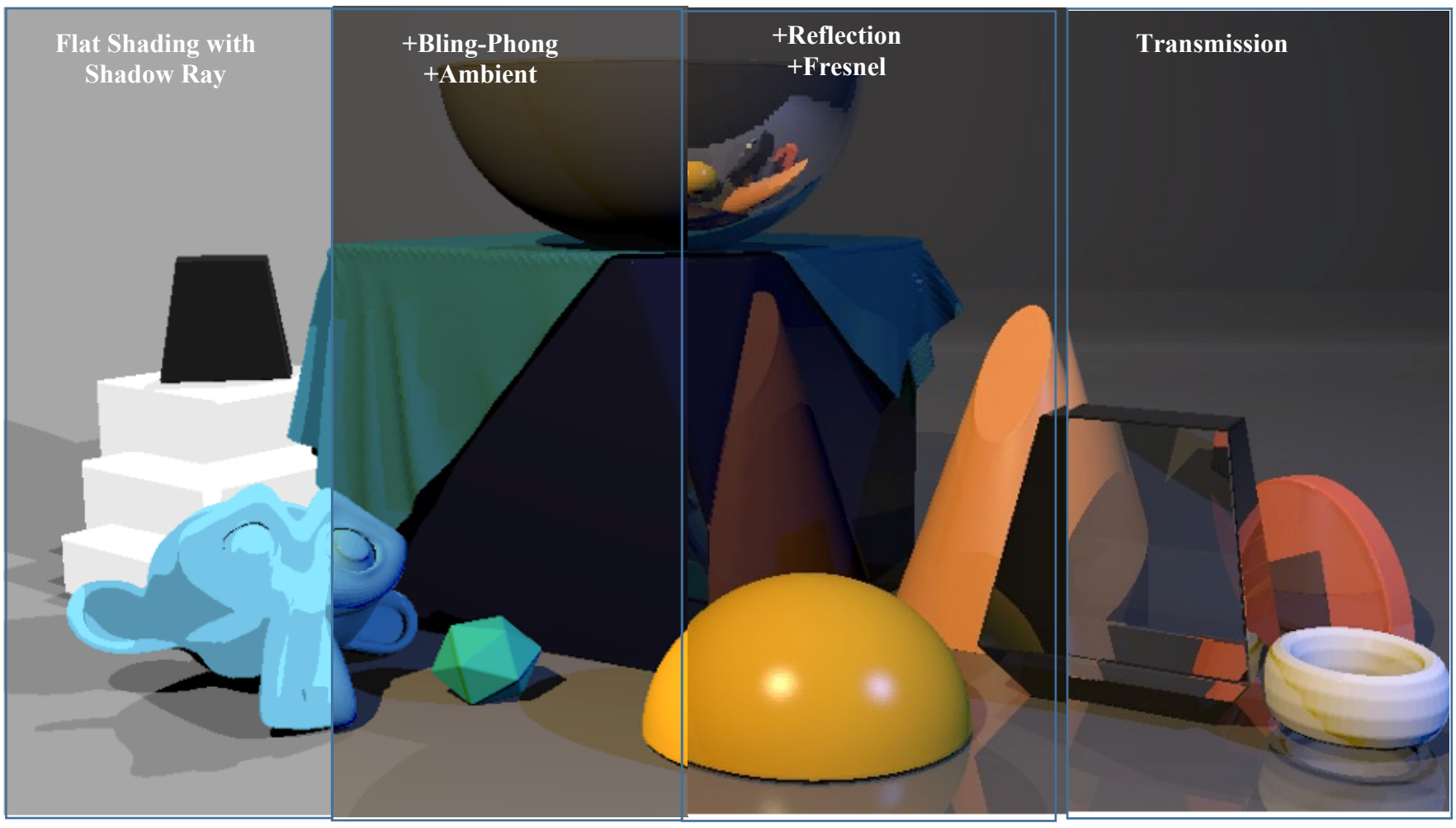
Fall 2023

Project 5

Ray Tracing-2

This assignment is due by 23:59 on Friday, 17 November 2023

In Project4, you did the parts of Shadow Ray, Blinn-Phong Model, Diffuse Shading and Ambient Light. Project5 is the continuation of the Project4. For Project5 you will add reflection, Fresnel and transmission on the work. **For this, please download the .blend file from LMS, add your first codes and continue with the instruction on the code comments.**



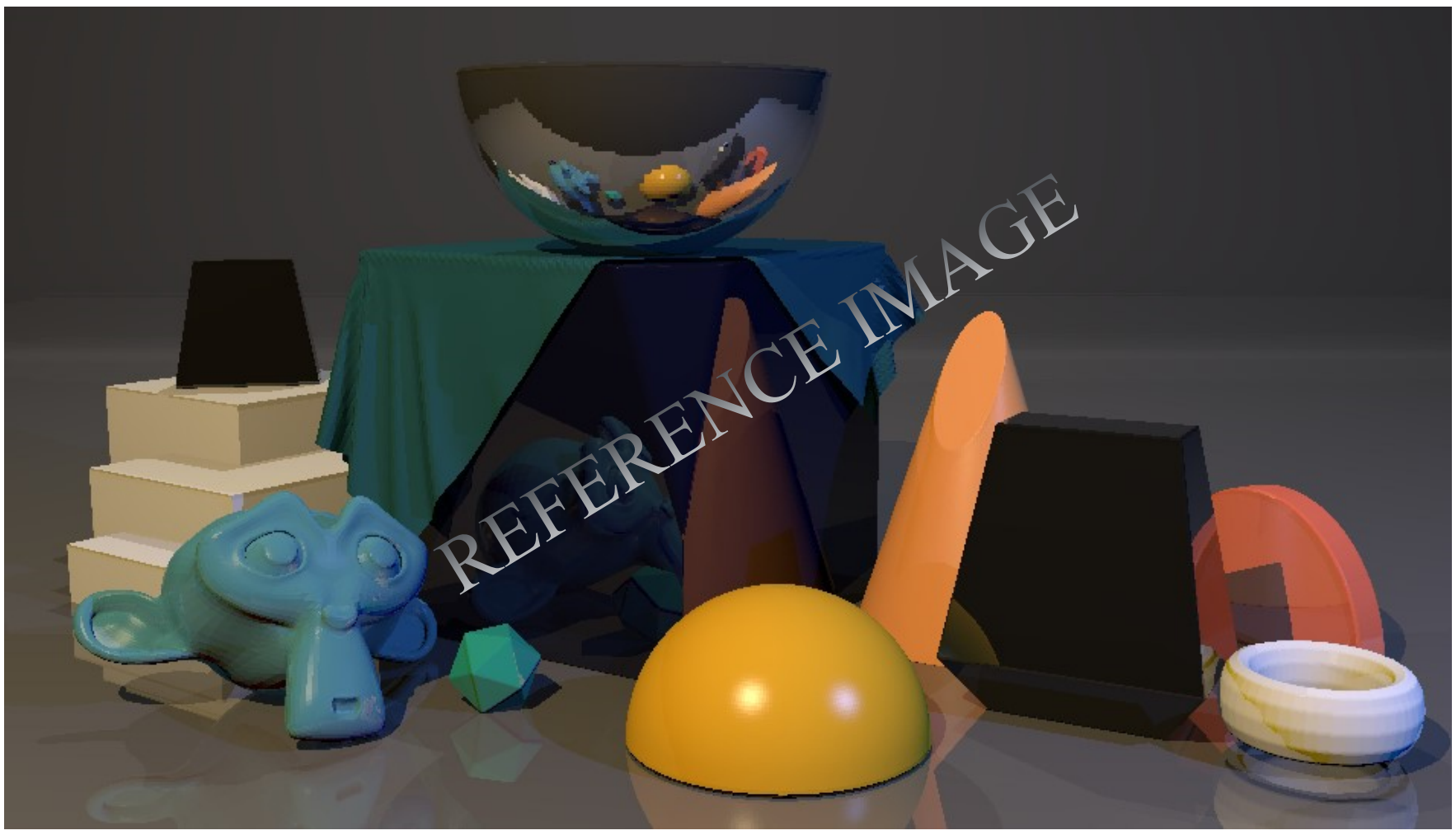
2.4.Reflection

With recursive ray tracing, the hemisphere on the top should show a reflection of the whole scene.

☐ **Checkpoint 4:Save the image with reflection.**

2.5.Fresnel

Since we're viewing the ground plane at a grazing angle, the reflection should be stronger.



☐ **Checkpoint 5: Save the image with fresnel.**

2.6.Transmission

The black block should turn into glass, and the green truncated cone should show through it.

☐ **Checkpoint 6: Save the image with transmission.**

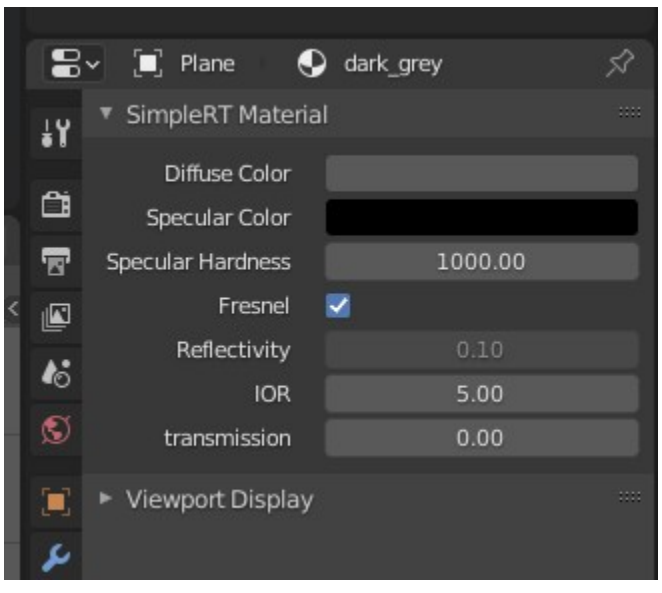
3.Play with camera, material,lighting

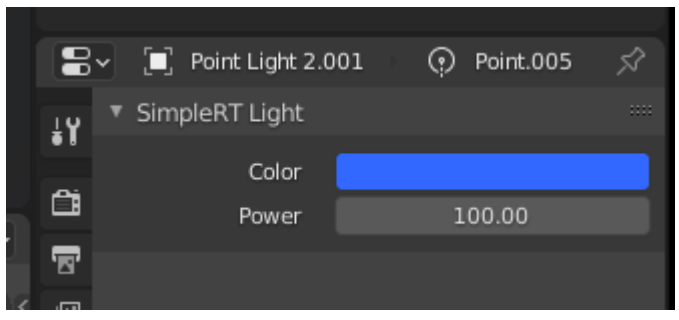
> Remember to use the default scene and render settings for submission! Make a copy of the .blend file if you want to play with these settings.

Just as the render engines that come with Blender, we can change the camera, materials, and lights in our SimpleRT render engine. In the starter script, we have already setup the panels for materials/lights and hooked them up in the ray-tracing code.

For objects, we will use SimpleRT Material. If you select an object, then go to Properties Editor → Material Tab, you will see this panel. Here you can change all the settings, and they will be updated immediately. When you render, you will see the new settings applied. Same thing for lights and camera at Properties Editor → Object Data Tab. To get consistent results between the 3D viewport and the final render, please keep the SensorFit option to Horizontal for the camera.

If you want to dig really deep, the code for creating these custom panels are in the *simpleRT_UIpanels* script.





PROJECT REPORT SUBMISSION

!!IMPORTANT!!

This lab report is due by 23:55 on Friday, 17 November 2023.

You can complete this project **individually** or groups of **two people**. Please don't forget to write the names of both people in the group in your report.

After finishing the assignment, please upload your pdf file and upload your simpleRT_plugin.py code (TODO4:, TODO5: and TODO6: parts are enough) to VPL on the LMS.

Follow the instruction and prepare a pdf file for uploading to the LMS, your pdf file should include all parts. Please make sure your answers are numbered as below.

PART 1

A. Save the image with reflection and add the screenshot of it on your pdf file.
B. Explain your process and effect of reflection.

PART 2

A. Save the image with fresnel and add the screenshot of it on your pdf file.
B. Explain your process and effect of fresnel.

PART 3

A. Save the image with transmission and add the screenshot of it on your pdf file.
B. Explain your process and effect of transmission.

After finishing the lab report please upload **your pdf file** and your **TODO parts of code** on the LMS.

GRADING RUBRIC

Project5	Points
PART 1	**15**
Save the image with reflection and add the screenshot of it on your pdf file.	5
Explain your process and effect of reflection.	10
PART 2	**15**
Save the image with fresnel and add the screenshot of it on your pdf file.	5
Explain your process and effect of Fresnel.	10
PART 3	**70**
Save the image with transmission and add the screenshot of it on your pdf file.	5
Explain your process and effect of transmission.	15
Submit your code to VPL.	10
Quiz	40
TOTAL	**100**