Distributed Renderer

CIS565 Final Project
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FINAL REPORT

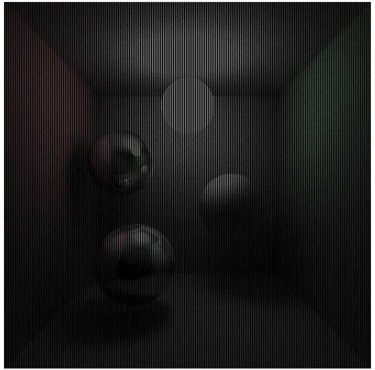
Project Status

- Networking and Render Division
  - TCP is used for sending and receiving data.
  - The scene definition is sent by the viewer to the Leader and the leader distributed is over to the other renderers.
  - When the renderers are done with n iterations, they send the image data to the leader. The leader accumulates all the data and returns it to the viewer.
- Rendering
  - We use Multiple Importance Sampling for the backend renderer.

Render Division

- Based on the number of rendering systems, divide the image to be rendered.
- Use render id as offset for starting the render
- Use total renders to find the pixels to be rendered.
- Example :
    - Let total renders = 4
    - Pixels rendered by Renderer id 0 : 0, 4, 8 ...
    - Pixels rendered by Renderer id 0 : 1, 5, 9 ...
    - Pixels rendered by Renderer id 0 : 2, 6, 10 ...
    - Pixels rendered by Renderer id 0 : 3, 7, 11 ...
- ***TODO*** : Accumulate the image from all the renders to get the final image.

Screen Shots (Render division)



Render ID 0

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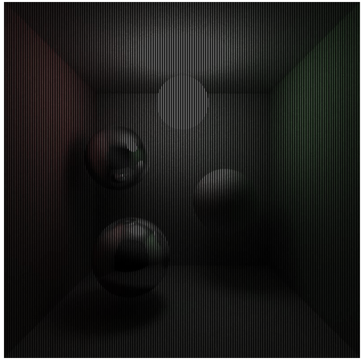
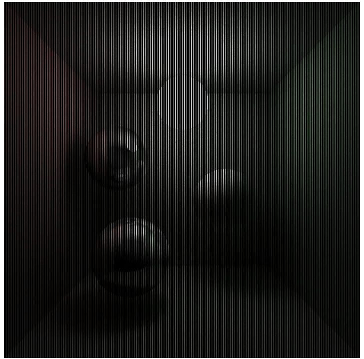
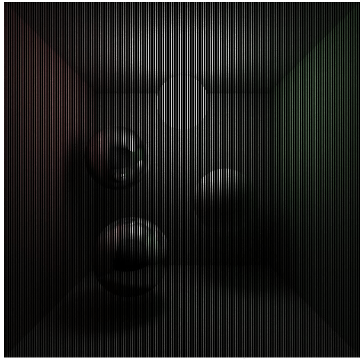


Render ID 1



Render ID 2



Render ID 3

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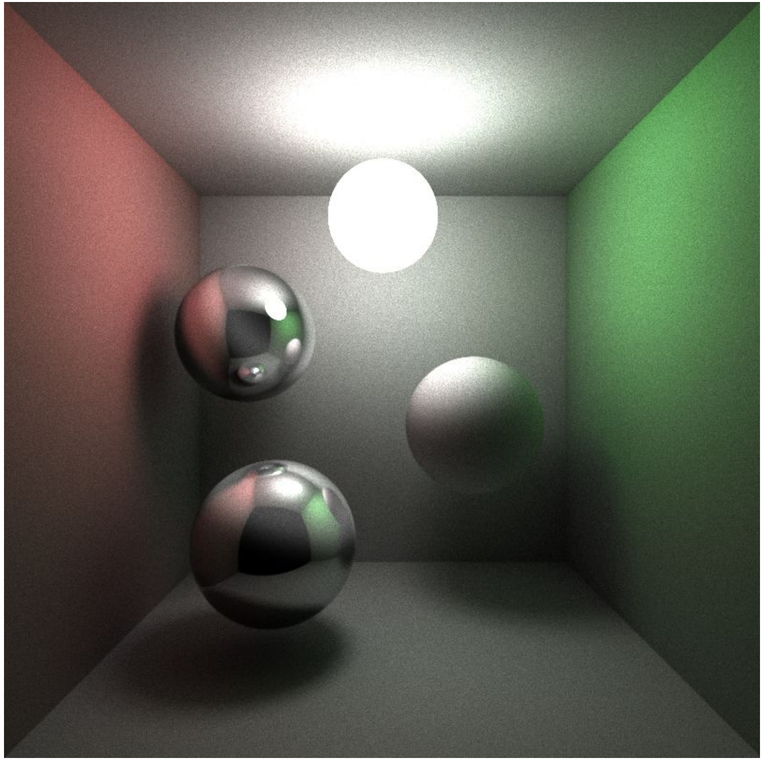
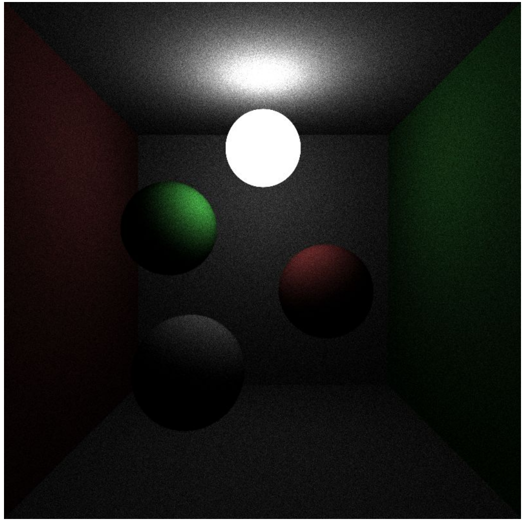


Full render

Screen Shots (BIS + LIS = MIS)



BRDF Importance sampling (FIXED)

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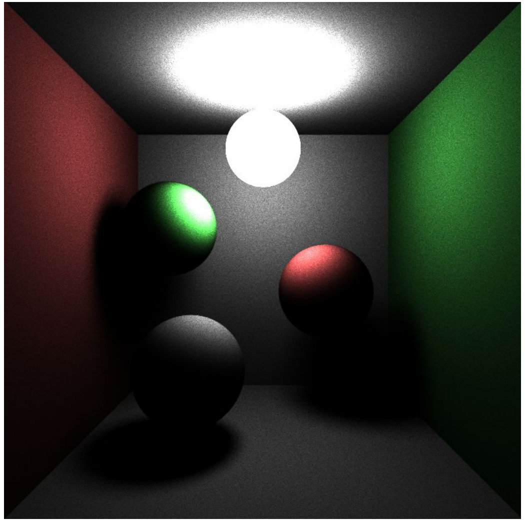

Light Importance sampling (FIXED)

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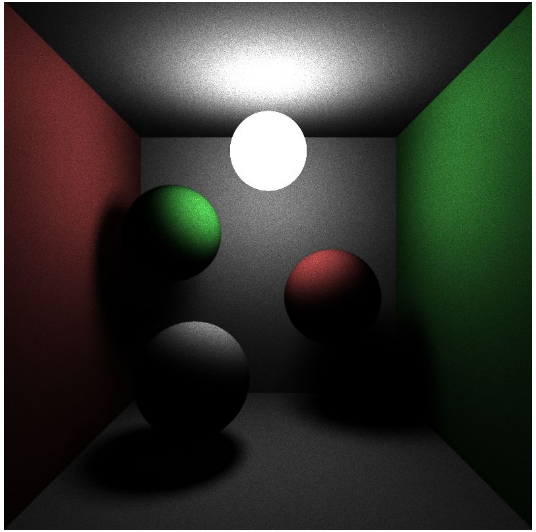
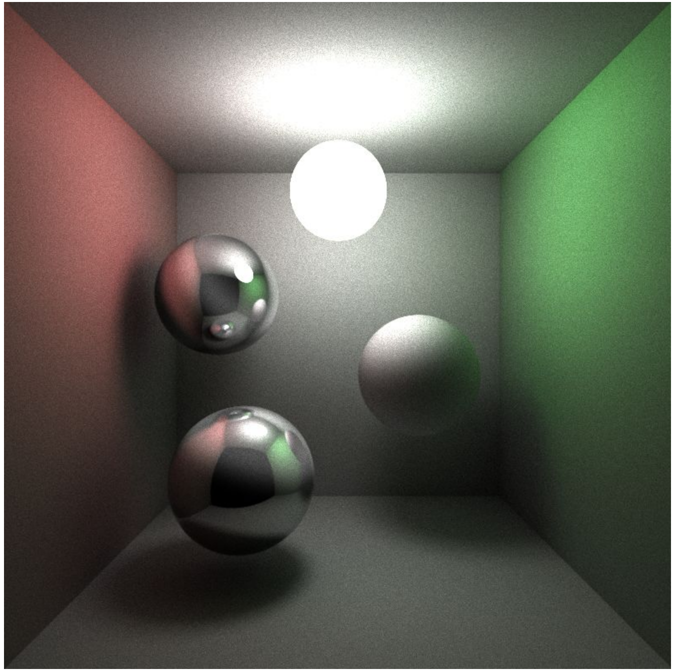
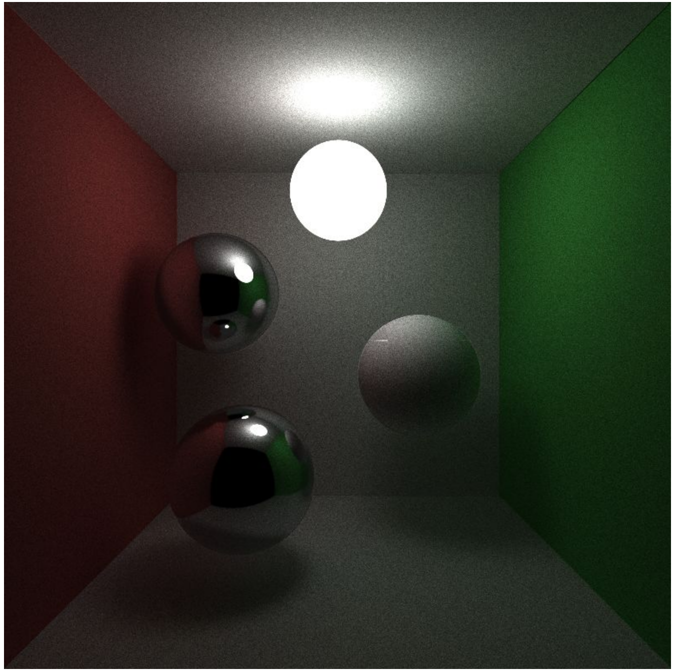


Multiple Importance sampling
[Direct Illumination]

Screen Shots (Comparison MIS vs CIS565 HW)



MIS Path Tracer
(Trace Depth 3, 1000 samples)



CIS 565 Path Tracer with Direct Illumination
(Trace Depth 3, 1000 samples)