Distributed Renderer

PROGRESS REPORT #2

CIS565 Final Project
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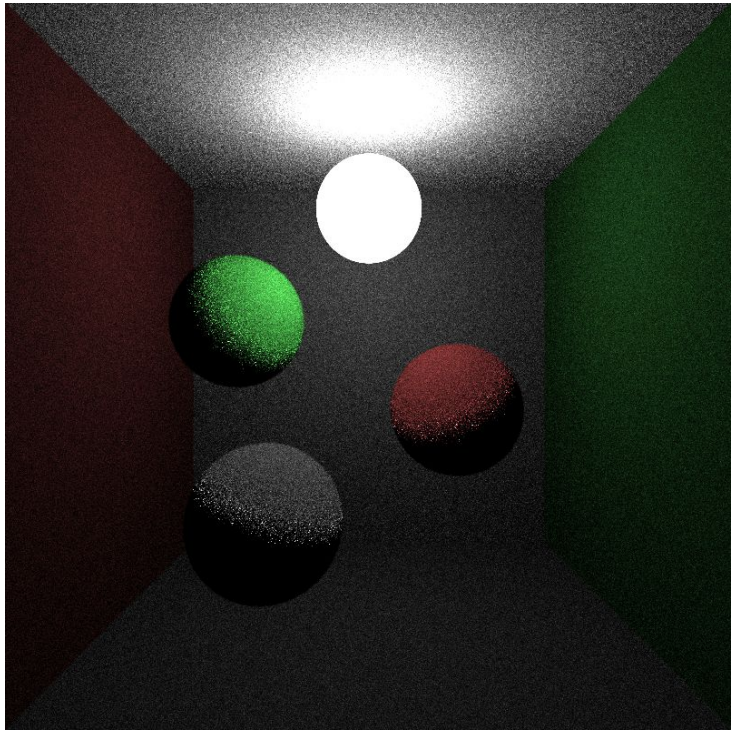
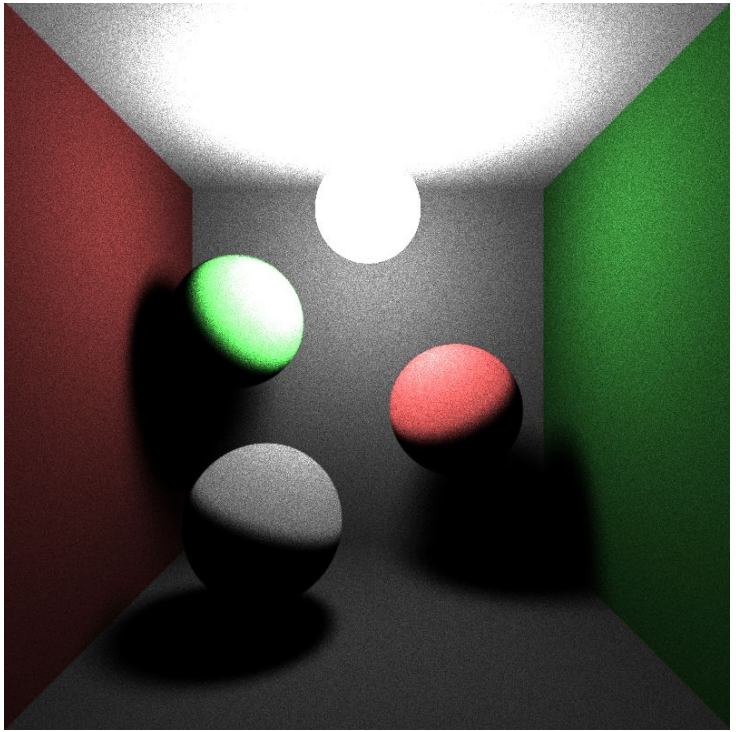
Progress

- Multiple CUDA Renderer (Centralized) & 1 Viewer
  - Divide scenes horizontally.
- Fixed image sending error
  - The indices while packing data were incorrect.
- Importance Sampling
  - Light Importance sampling and BRDF Importance sampling implemented
  - Multiple importance sampling using power heuristics working
  - Current version supports diffused surfaces and direct illumination

Screen Shots

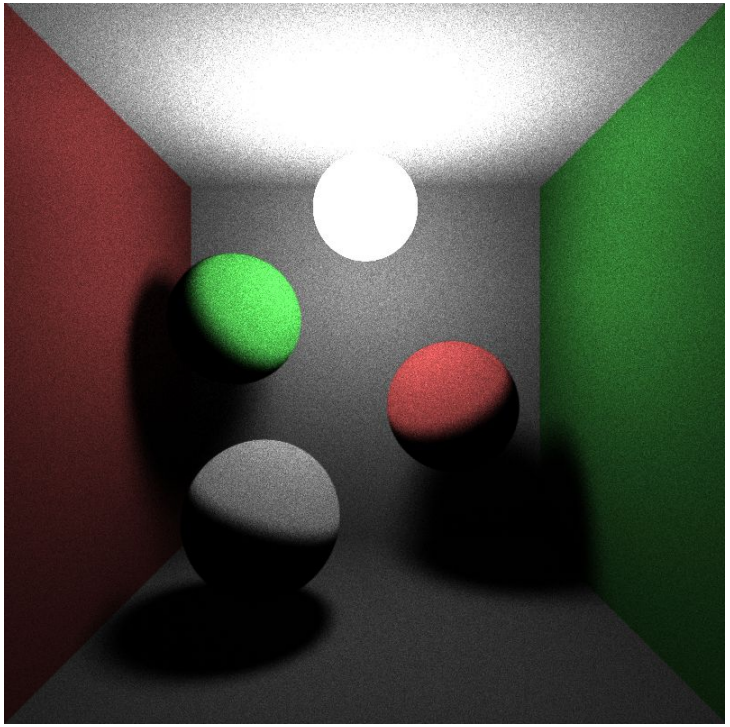


BRDF Importance sampling

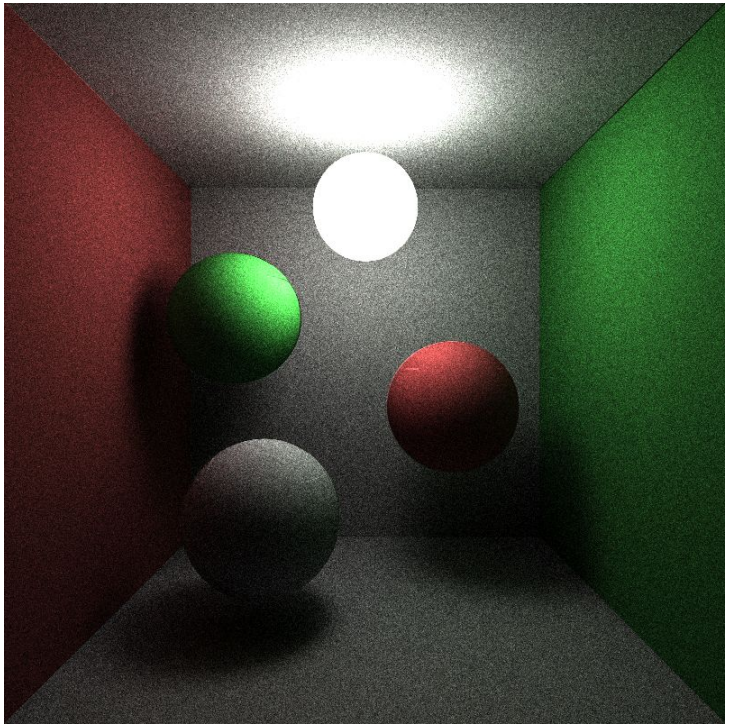


Light Importance sampling

Screen Shots



Multiple Importance sampling
[Direct Illumination]



CIS 565 Path Tracer

Problems

- There are too many pixels sent to the front end at the same time!
  - The listener thread is not fast enough to handle all the packets at once, causing “Packet Drop”
  - Beats the purpose of using UDP. (Reducing overhead to handle all the incoming packet from >1 renderers.)

Next

- Test & Find better strategy for pixel info collection.
  - Switch to TCP?
- Scene file + objects/model distribution
- Derive the best “workload dividing” strategy
  - Stress test.
- Indirect Illumination
  - Find the throughput at every step and implement indirect illumination by accumulating the ray color.
- Material
  - Add BxDF for more materials like specular and refractive.