CSE306 Project Report

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1 Introduction

In this this project we have implemented rendering of diffuse and mirror surfaces under direct or indirect light. The code can be compiled with the following command:

g++ -o spheres -O3 -I../include -fopenmp main.cpp

The file vector.cpp contains all the class and function definitions.

2 Examples of implemented features

Maximum path length and the number of paths for the computation of indirect lighting can be adjusted in main.cpp, from variables ray_depth and number_of_paths.

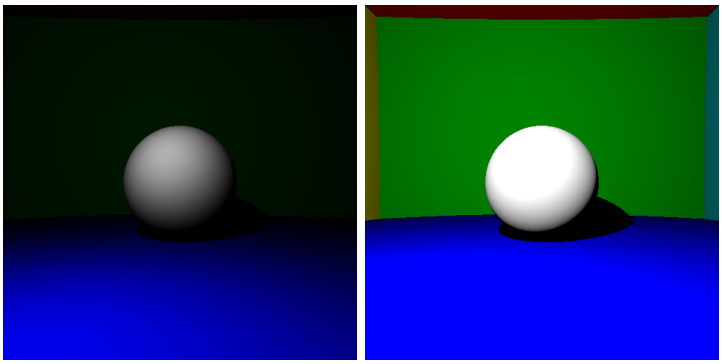

Figure 1: Left: Diffuse surface with direct lighting, no gamma correction
Right: Diffuse surface with direct lighting, with gamma correction, Render time = 42ms

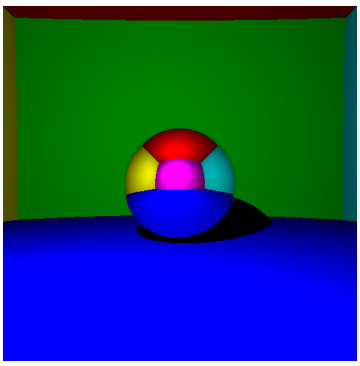

Figure 2: Mirror sphere under direct light, Render time = 40ms

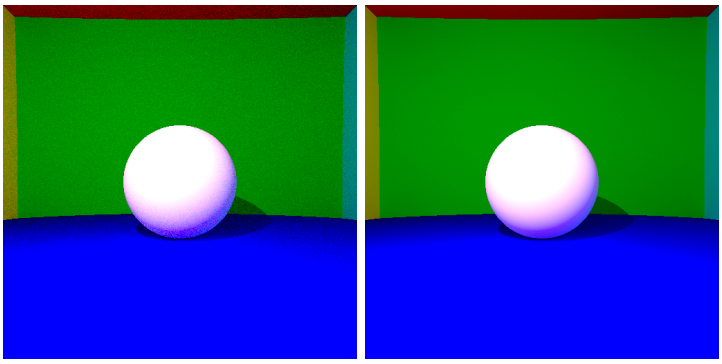

Figure 3: Diffuse sphere under indirect light, Left: Maximum path length = 5, Number of paths = 32, Render time = 2,7 seconds
Right: Maximum path length = 5, Number of paths = 1000, Render time = 91 seconds (patallel)

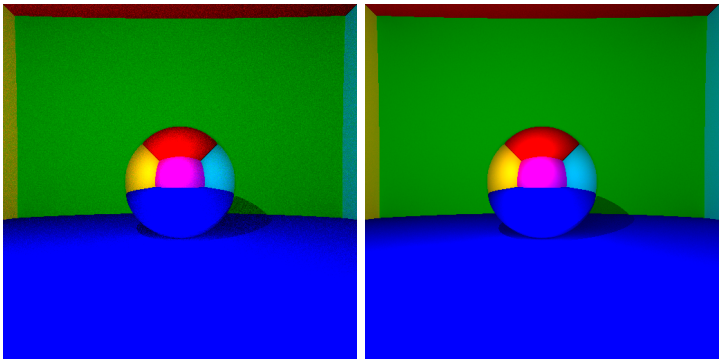

Figure 4: Mirror sphere under indirect light, Left: Maximum path length = 5, Number of paths = 32, Render time = 2,8 seconds
Right: Maximum path length = 5, Number of paths = 1000, Render time = 95 seconds (patallel)